



## **Is Tartar a Cause of Pyorrhea Alveolaris ? The Logical Test Applied.**

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Considering the amount of space that pyorrhea is occupying in dental literature and proprietary advertisements, a discussion of its etiology, based upon "causation" as treated by logicians, should be acceptable.

This paper is not an attempt to solve the etiology of pyorrhea. Its main object will be to present an acid test which will eliminate some of our present fallacies and which will be applicable to future supposed solutions of our causal difficulties. After discussing the choice of name, it will show that the term pyorrhea is now used in a manner that precludes the possibility of our ever getting anywhere in searching for a cause.

It may enable the reader to follow the argument better if he will keep in mind the absolute necessity of a cause being invariable in its action; that causes are mere links in changes; the change that immediately precedes another change is the cause of the second change, and the second change immediately becomes the cause of the third change. It will also point out that there may be many elements in a cause but that tartar could not be one. It will illustrate the operation of the method by elim-

inating tartar as a possible cause or element in the cause of pyorrhea. It shows the use of a syllogism and summarizes rules that are used and which anybody can apply. It concludes by calling attention to the fact that if we acknowledge that pyorrhea can occur without tartar that it must be eliminated as the cause or an element in the cause.

I do not go into the difficulties that will be encountered in applying these tests to our search for the cause of pyorrhea. I am merely suggesting a test that should be valuable in trying out our hypotheses and thus preventing us from wasting energy on false premises.

When I started to write, I expected to make the viewpoint of this paper my introduction, but it has already expanded to such proportions that it is too long and sufficiently conclusive.

Before going into the main question it would seem advisable to devote a few paragraphs to a discussion of the nomenclature of the many-named condition usually referred to as pyorrhea.

**What's  
in a  
Name?**

"What's in a name?" is a familiar quotation. Sometimes, we can express in a name all the attributes of the thing denoted; at other times a name is a mere tag which does not possess any of the properties of the thing designated. Descriptive terminology is very desirable, but standardized definition is a necessity.

Names, like other words, are symbols by which we express our thoughts. We cannot express our thoughts unless we are able to transfer our exact concepts. So that when connotation is impossible, as in the case of the condition designated by the word pyorrhea, we must first carefully define the condition and then choose a word-symbol.

As Hobbes expresses it: "A name is a word taken at pleasure to serve as a mark, which may arouse in our mind a thought like to some thought which we had before, and which, being pronounced to others, may be to them a sign of what thought the speaker had before in his mind."

Then, the first requisite of a name is to designate an exact concept. Mental intercourse depends upon it and the degree of our comprehension is in direct ratio with the exactness of the transferred concepts. Definitions isolate concepts.

A man whose concepts are expressed in but one language, could not possibly carry on a discourse with a person speaking any other language. He might have a thorough knowledge of the meaning of every word he used and so might a person using words of any other language, but there could be no understanding between the two. We must agree upon the meanings of words and then use them in those meanings. As H. G.

Wells says: "Common words used in uncommon meanings sow a jungle of misunderstanding."

In my experience there is a jungle of misunderstanding as to the inflammatory or other transitory state at which pyorrhea begins. Too much effort has been given to descriptive nomenclature and not sufficient to defining the term used to symbolize the condition. In the advanced stages we would all agree but in the first, few of us, probably, would concur.

There are various kinds of definitions. They depend upon our viewpoint. Joyce gives seven. Among them are "descriptive" and "causal." The causal is desirable, but the descriptive is necessary. We cannot have a concept of such a condition as pyorrhea without it.

Jevons defines a definition as: "...the briefest possible statement of such qualities as are sufficient to distinguish the class from all other classes and determine its position in the general classification of concepts." Do this and it does not matter whether the term by which we designate the pyorrheal condition spells, scurvey, false scurvey, stomacace, odontolithus, expulsive gingivitis, phogenic alveolaris, devastating process, infectious alveolaris, phagedenic pericementitis, ulceration of the pericementum, conjoined suppuration of the gums and alveoli, interstitial gingivitis, pyorrhea, or suppuration of the gums (as it was called by Bourdet about 1757).

The word pyorrhea is frequently used in dental literature as a general term. We speak of it as having constitutional and local causes. They are subdivided. Dr. Frederick Hecker, for instance, gives eleven different constitutional varieties. Therefore, we cannot refer any cause to pyorrhea (in medicine that term always refers to a specific) any more than we can say that disease or inflammation has a specific cause. The specific determines the form the disease shall take. Predisposed tissue will succumb to the first sufficient cause. If it be the bacillus typhosus, then the victim becomes a typhoidal patient; if it be bacillus diphtheriæ, then a diphtheritic patient, etc. We can have inflammation from any form of irritation, whether it be chemical, contusive, or other abnormal condition. We say that pyorrhea is caused by the use of the rubberdam, by blows, by pressure of food, by bacteria, etc.

A cursory knowledge of causation convinces one that we must be more specific in our use of the term if we wish to refer any cause to pyorrhea. We need not seek a cause for pyorrhea used as a general term.

But pyorrhea is viewed by some as the product of a deposit, by others as being caused by specific bacteria.

I was particularly impressed, not long ago, while discussing the emetin treatment with a friend, of the necessity for a determining definition. He would not believe that conditions which I had cleared up were pyorrheal. To his mind, emetin only is efficacious.

The successful use of drugs is largely dependent upon the ability of the user to define, to diagnose accurately. While treatment for diphtheria might be sufficient for a bad case of common sore throat, the treatment for ordinary sore throat would hardly suffice for a bad case of diphtheria. If the term diphtheria were so loosely applied as to cover all pathologic conditions of the throat, the percentage of efficiency of diphtheritic specifics would be greatly increased. So also would the number of the remedies and the haziness of the real symptoms.

Drugs deal with causes. Unless we know the cause of a trouble we cannot expect to administer drugs with any degree of uniform success. The variableness of success in administering drugs for pyorrhea is one proof of our ignorance of its cause.

#### **The Cause of Pyorrhea.**

No subject in dentistry has been more discussed than the cause of pyorrhea. Lessing says that if somebody had not wrangled we would not agree on any one subject. Discussion has undoubtedly cleared up many points in the pyorrheal enigma but there are still many unsolved mysteries.

Discoveries are often obstructed by fallacies. Columbus's purpose was almost defeated by the superstition of his sailors, so that the elimination of fallacies is a step in the right direction. The means of eliminating some of the pyorrheal fallacies is the major object of this paper.

In cogitating upon the cause of pyorrhea one of the things that troubled me was to determine just where a cause begins. A man falls from a roof. Was the elevation, gravity, the force of the push, the hand that pushed him, the mind that directed the hand, the angry words that anteceded the push, the mental state they produced, the nearness to the edge of the roof, or what, the cause? Where did it begin?

In casting around for a solution of my causal difficulty, I was led to logic. There I found principles used by men who have given us epoch-making discoveries. These principles should eliminate some of our pyorrheal fallacies. The first one is the local-cause theory. The principles here applied to it can be used on others. Technically, tartar is never the cause of pyorrhea, nor can it be considered an element in the cause.

#### **Relation of Logic to the Science.**

As early as the thirteenth century Duns Scotus called logic the "Science of Sciences." Joyce says logic is: "The science which directs the operations in the search of truth." Jevons says it is about as rational to say that we can reason well without logic

as it would be to say that we can live healthily without medicine. Jevons points out that the word logic enters into the name of most of our sciences. They are nearly all "ologies." We have pathology, physiology, theology, etc., or the logic of disease, etc.

Of course, everybody uses logic consciously or unconsciously. The latter class lack the aid of logical formulæ. As logic is the "science of the laws of thought," its aid should be invoked always to test the validity of conclusions which are reached from obscure data. Up to a few years ago the custom of testing statements by reducing them to syllogisms and then analyzing these by logical tests was practiced in European universities.

To test anything one of the first requisites is an open mind. Descartes lays down the maxim that: "When we wish to arrive at the truth we must doubt everything we ever believed and especially those things about which we are most certain." This is not always an easy matter. Our beliefs too often stick like barnacles and impede our progress toward a solution and frequently even prevent our investigating matters about which we have very little proof, but about which we do have inflexible opinions.

One means of correcting our delusions is to refer them to some standard. The application of a foot-rule soon dispels the most positive linear optical illusions. But the standardization of the device must be established in our minds. Nobody can read books on logic without being satisfied with the methods which they expound. They are the methods of such men as Newton, Kepler, Faraday, Copernicus, Pasteur, etc. The tests used in this paper speak for themselves.

Nothing seems to be more unanimously and positively accepted by logicians and all other scientists than the "uniformity of nature." That is, that like produces like, as far as cause and effect is concerned.

Joyce interprets the inductive canons "one and all" to be based upon "the same law, viz., that when of two facts the one can appear without determining the presence of the other, there is between these no causal relation." In another place he says:

"It follows that though we may say truly that the same cause must in like circumstances always produce the same effect, the necessity of this principle is hypothetical necessity. It supposes the First Cause to preserve the ordinary operation of the natural laws. . . . .

"Thus the very concept of a natural agent devoid of free-will, involves that under the same circumstances its action will be of the same kind: and precisely similar considerations show that similar effects must be referred to causal agencies of the same kind. In other words Uniformity of Nature is an analytic judgment."

Prof. Hibben says:

"The whole tendency of modern logic is to base the causal postulate upon a ground which is epistemological; namely, inasmuch as our knowledge is one and self-consistent throughout all its separate elements, there must be a corresponding invariability in the phenomena themselves as there is in the system of knowledge which results from the interpretation of these phenomena."

Joyce further shows the invariability and reciprocity existing between cause and effect in the following statement and syllogism:

"We must not merely establish the proposition 'if M, then P,' but the reciprocal of it, 'if P, then M.' In other words they must be simply convertible. We are thus enabled to form the syllogism:

"P is M  
S is P  
∴ S is M

"In this way we demonstrate that the agent M is present in every S...."

Scientific causality began with the Greeks. One of the first objects of their speculation was the cause of the floods of the Nile and in recording that Herodotus showed a knowledge of the law of causality in rejecting the theory that they were caused by the North winds, as other rivers which flowed in the same direction did not have floods, and also because the floods occurred in the absence of North winds.

The early astronomers tried to reduce their proofs to rules. They sought uniformity. Tycho speaks of variation as one of the inequalities of the moon. Copernicus juggled his solar system until he arranged it so that no change could be made without disturbing the whole. He was after uniformity and when he found it, he concluded that he had solved the mystery.

Prof. Case in his "Scientific Method" says that Kepler arrived at his conclusion that the path of Mars is an ellipse by being able to construct a syllogism outlined as follows:

"Such and such positions are properties of an ellipse.  
The orbit of the planet Mars has such and such a position.  
Therefore, the orbit of the planet Mars is an ellipse."

Let us apply the syllogistic test to the local theory of pyorrhea.

**The Test of  
Logic as to the  
Cause of Pyorrhea.**

No. 1. Pyorrhea is always caused by tartar.  
Mrs. Jones's teeth are coated with tartar. Therefore  
Mrs. Jones's teeth are pyorrheal.

No. 2. Mrs. Jones's teeth are pyorrheal. Pyorrhea is always caused by tartar. Therefore Mrs. Jones's teeth must be covered with tartar.\*

\*Syllogisms consist of three propositions.

There are four kinds of propositions: The universal affirmative, all X is Y; the universal negative, no X is Y; the particular affirmative, some X is Y, the particular negative, some X is not Y. The Universal are qualified by such adjectives as all, every, always, each, any, the whole, etc. They are general statements which admit of no exceptions. For instance, when I say "all pyorrhea" there is no room for exception. Causes are always universal. I have tried to emphasize this. Therefore, causes must be stated in a proposition by using one of the qualifying words I mention—all, etc. It is therefore necessary to say that, "Pyorrhea is *always* caused by tartar. There can be absolutely no exception. With an universal major premise, the conclusion of this syllogism could be only, "Therefore Mrs. Jones' teeth are pyorrheal."

The cause of phenomenon is often present without the phenomenon occurring because the conditions are not favorable. So that because pyorrhea is not present when there is tartar is not the test for its cause in all cases. That merely rejects "If N, then P" as a test. But we still have the "If P, then N" test which No. 2 illustrates. In other words, while the conditions or circumstances have prevented the cause from operating, if we have the effect at all we must necessarily have had the cause. Therefore, pyorrhea can never occur without tartar, if tartar be its cause. We all know that it does and as it does, tartar cannot be the cause of pyorrhea. In other words, if a five dollar bill were the only means of getting through the World-Series gates, then we know that everybody we see inside must have paid his five dollars.

There is no way for an effect to occur without its cause having preceded it. Its cause is always the same set of antecedent elements. The circumstances and conditions may change. (In medical causation, the predisposing cause might be considered the conditions and circumstances.) Therefore, unless we can construct a syllogism of a cause similar to both No. 1 and No. 2 that will not contradict our experiences and knowledge, we are testing what is only a supposed cause.

These syllogisms might be differently arranged and other words might be used, but the purport could not be changed one iota. Does it express our experience? If not the local hypothesis has failed to stand this test.

Riggs would argue that if tartar is not present it is because it has been dissolved away. That it was present long enough to initiate the trouble. Not many of us will agree with that. If we did, Dr. Riggs considered but one horn of the dilemma. He did not attempt to show why X is not followed by Y.

Somebody else argues that according to medical divisions of the sufficient cause, when you say tartar is the cause of pyorrhea you, of course, mean the exciting cause. When you refer to the cause of any disease



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you always mean the antecedent of the specialized disease. The tissue area had been made ready for the initiating specific. But the definition of an antecedent constitutes an impossible obstacle to the acceptance of tartar as being a possible initiating agent. Antecedents are variable changes.

I cannot emphasize the "changes" too strongly. As Bergson would say, an antecedent is a "flow"; constant action, movement, transition, a constant becoming. The technical cause is necessarily the immediate antecedent. Let me illustrate by the links of a chain. Starting from one end the second link holds the first to the rest of the chain, the third the second, etc. Of course, they each contribute their quota to the integrity of the whole, but it would be very indefinite for our purpose to say that the twenty-third is the cause of the integrity of the whole. All things being equal, it is no more the cause than any other link. We can, however, speak definitely when we say that the second holds the first to the rest of the chain. The process of cause and effect is similar to that of making a chain. One link after another is made and joined onto the succeeding. It is a concatenation. In cause and effect we have a chain of antecedents and consequents. As soon as the consequent is attached to its antecedent, it becomes the antecedent of the next link or consequent. So that every effect becomes the cause of the next effect-link. Unless we adhere to this form of reasoning, we cannot point definitely to any cause. We spread out our cause so that there is no point to it. We have the problem of the cause of the man falling from the roof.

Now, then, let us apply this test to tartar as the consequent of pyorrhea. Is there anything in the nature of tartar that would suggest it as being the antecedent? Is it likely to change from day to day? If it does not change then it cannot be an antecedent. It is simply a condition. Joyce gives this definition of a condition: "That which in one way or another enables the causes to act in the production of the effect, but which does not make the thing what it is." Joyce makes the striking of a match a condition and proves it by showing that the match could be ignited by heat, percussion, chemicals, etc. Such a condition is a determining cause. Unfortunately tartar lacks action. There is no analogy between a deposit of tartar and the striking of a match. Tartar is practically a constant; a cause is always a variable. There is an analogy between tartar being one of the supposed causes and the striking of a match being one of the means of igniting it.

Let us compare it to infectious diseases. Whatever their antecedent there is always action. The exciting cause is the poisons introduced by bacteria. Action again. When we say that a person died from diphtheria

we do not name bacteria as the cause but the disease produced by them Diphtheria is not a germ but the consequent of germ products.

This reasoning is not so clear when we come to benign growths. Still, there is action here to. There is a constant sapping of the vitality by the growth. Growths that are fatal are active. They expand.

Take the case of concretions such as gallstones. They become the cause of trouble when they lodge in a passage. They are then active.

The gradual increase in size of gallstones may enable them to obstruct a passage and the gradual increment of a deposit increases the area of its impingement, but experience has demonstrated that there is not a corresponding increase of even inflammation, in some cases. The change, when tartar seems to be a factor, is in the vitality of the tissue. It may help the cause to act. It is then an element in the condition, not an element of the cause. It does not meet the quantitative test to be given later.

A circulating embolus may cause little trouble. Let it lodge in the bifurcation of a brain artery and it becomes very active.

<p><b>Relation of Tartar to Adjacent Tissues.</b></p>	<p>Does tartar acts as do tumors by impinging upon contiguous tissue? Let us see whether it does? Sanguinary tartar is deposited below the gum margin. Let us select also a given position for a benign tumor. Say in the throat near the trachea. Every unit of addition to the tumor increases in direct ratio the distress from the extra impingement. Does that occur in the case of tartar? Is the degree of pyorrheal trouble proportionate to the increment of tartar? As a matter of fact experience clearly demonstrates that it has nothing to do with the degree of pyorrheal trouble. We may even have one without the other. Could this possibly occur in the case of the tumor? Manifestly not. Then there is no analogy.</p>
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I repeat that relatively tartar is a constant. If it has any part in the cause of pyorrhea it is operative only during a great depression in the vitality of the tissues. In this case the variable is the vitality of the tissue and tartar a condition. Not a determining cause condition, however. Consider the rapid changes that take place in tissues. Fear may blanch the lips. Cold causes a bluishness, etc. The antecedent might easily be the change in vitality, but tartar cannot be considered as even an element. The X that causes Y may have many elements in it but they are all variables. Constants are conditions. Scientific tests are always directed to eliminate circumstances that do not participate invariably. As soon as it is found that Y can be produced without a certain circumstance being included in X, then that circumstance is eliminated. It is not an element in the cause X.

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The thoroughness of these tests are suggested by the following summary of those used in the inductive method which is the method employed in medical causation:

(1) Method of Agreement: When the cases under investigation are *invariably* preceded by a common circumstance, that circumstance is probably the sufficient reason for the phenomena.

(2) Method of Difference: If in two cases, in one a phenomenon occurs and in the other it does not, then eliminate all the circumstances that are common to both. Investigate by further tests the circumstances that were present when the phenomenon did occur. This is a negative test.

(3) Method of Residues: If we determine a b c is caused by A B C and then that A causes a, B causes b, it follows that C is the cause of c.

(4) Method of Concomitant Variation: This is a quantitative test and used when the antecedent cannot be isolated. When an increase of the units of the antecedent produce a correspondently increased variation in the consequent then it is concluded that there is probably a causal relation between the antecedent and the consequent.

Weldon expresses No. 4 in the following formula: " $A_1 B C—a_1 b c$ ;  $A_2 B C—a_2 b c$ ;  $A_3 B C—a_3 b c$ : whence we conclude that A is causally related to a."

Mercier adds a fifth: The Composite Method or "the cumulative employment of all the preceding."

Experientially, the local theory as to the cause of pyorrhea would not stand one of these tests to the elaboration of which Hibben devotes fifty-five pages.

If we concede that pyorrhea is ever possible without the presence of tartar, then according to the "Science of the laws of thought"; "... the science which directs the operations of the mind in the attainment of truth"; "... the systematic order to be observed in judging, reasoning, and other processes of thought in order to arrive at the knowledge of truth"; "The science of sciences," tartar is never the cause or even an element in the cause of pyorrhea. Anybody who makes such a claim simply ignores the basic principles of "causation." Their contention will not survive one test.

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JUST A NOTE:—A great deal of importance has been attached to the response of pyorrhea to prophylactic treatment. There is no record of periosteum attaching itself to tartar, or of wounds surrounded by necrosed or tissue of low vitality, healing while full of dirt. What does that prove?



In the last three years my pyorrheal patients have had almost uniform success in treating their own cases. I have chosen people whom I knew were in earnest and would follow my instructions.

After an operator has thoroughly removed all deposits it is not what he does two or three times a week, but what his patient does three times a day that counts. Imagine a surgeon syringing out an old wound, making it aseptic for a few hours, and then turning his patient loose with the inflamed and low-vitality tissue unprotected against irritant and infectious substances for two or three days. Well?

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### **Note on Staining Amœba in Dry Smears, from Cases of Pyorrhea.**

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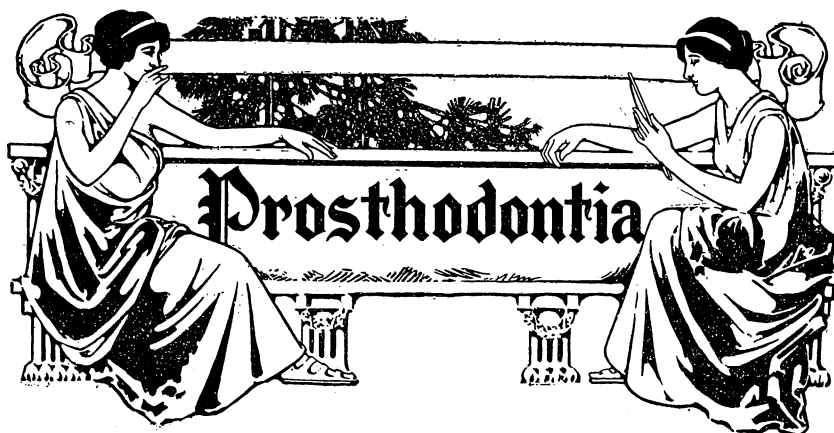
By THOMAS LE CLEAR.  
*Laboratory of Fraser & Co., New York City.*

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In the June issue of *ITEMS OF INTEREST* I described a method of preparing and staining dry smears for the detection of amœbæ. In the directions it was stated that the smears should be "fixed" by passing quickly through the flame of a Bunsen burner five or six times before staining. In the course of making a large number of such preparations, it was accidentally discovered that the smears could be stained without "fixing" and that very much better results are obtained when the "fixing" is omitted. Preparations are now stained without previous fixing as a routine in our laboratory, and the improvement in results is very marked, not only in the staining of the amœbæ, but in the staining of pus cells and the bacteria which take up the red stain.

By this modification (staining without previous fixing) the structure of the amœbæ is brought out to a remarkable degree and the inclusions, particularly those staining red, are very distinct. In some cases the amœbæ show partially extended pseudopodia, and the picture is so distinct that it is practically impossible to confuse amœbæ so stained with other cellular elements which might be present in such material.

Repeated trials have shown that it is not necessary to "fix" such material in order to make it adhere to the slide before staining, and that by omitting the heat decidedly better results are obtained. The heat apparently distorts some of the cellular elements and produces changes in these elements, whereby they do not take up the stains as readily.



**"The Application of the Chayes Parallelometer, the Parallelodrill and Attachments in the Conservation of the Reciprocal Functions of the Teeth Which are Used as Piers for Bridgework."**

By HERMAN E. S. CHAYES, D.D.S., New York.

The writer is receptive because while writing he attempts to discern the mental approach leading most directly to his reader's mind, and tries to so deliver or record what he conceives as truth, that it will as nearly as possible be in harmony with the reader's mental processes.

So that in a reflex sort of a way, the writer is really the reader, or the writer's reflector, his spokesman, his instrument, often voicing or giving crystallized form to innumerable thoughts emanating from the reader's mind.

It may then be hopefully assumed that in their essence, these articles voice what the profession at large feel or know to be true about this subject: that they have known these things to be true for ever so long, and that the writer is fortunate enough to be the favored one, actually influenced by the cumulative thought power of his confrères to the extent of caligraphically recording in concrete form, what has so long existed in the abstract or nebulous feeling.

This is a continuation of an article dealing with the specialized field of dentistry; with that part of dentistry which has to do with the restoration or replacement of lost teeth by means of bridgework.

Permit me here to make reference to the definition and classification of bridgework published in the ITEMS OF INTEREST, June, 1915, page 418 to 419. Also to that part of page 421 which follows the subtitle,



"Mobility of Natural Teeth," and since all of us are seeking the true solution of bridgework difficulties, and since I believe that such solution is partly contained in the article here referred to, and since I think that more of this true solution will be found in this present article, and in those which are to follow, I take the liberty of requesting that the article in the June number of the ITEMS OF INTEREST be carefully read over again, before we go any further in the perusal of this, the present one.

This will do some things for us; it will refresh our mind in regard to the general principles of this work; it will serve to check up any inaccuracies which may have a tendency to creep in, when one's hand, under the influence of mental activity, wields the pen too rapidly. Also it will save the otherwise necessary reiteration of the principles referred to.

A finished or refined medical effort, in behalf of any organ, implies a knowledge of its individual and relative anatomy or physical relationship and a comprehensive understanding of the physiological functions of that organ.

This brings us up to the affirmation that teeth have functions (plural used advisedly) and a careful enumeration and a critical classification of these functions are now in order.

We may now record the truth that the so-called masticatory apparatus is not a separate distinct and independent part of the human organism, but a functioning multiple member, or cog, of a very complex microcosm in the maintenance and preservation of which it plays a very important part.

This truth also: The so-called masticatory apparatus is not a simple functioning member of this complex machine, but is in itself, a very complex component, in that it comprises many organs diversely endowed with specialization.

#### **Reciprocal Functions of the Teeth.**

The thing that suggests itself first to my mind in regard to tooth function, is the reciprocal functions of the teeth, reciprocal because they do something for the organism which does something for them.

Since every organ of the body passively and actively exercises such functions, these may be called the "reciprocal functions," and must be classified as the "passive" and "active reciprocal functions" of the special organs.

#### **Passive Reciprocal Functions.**

The passive reciprocal functions of the teeth are defensive, cosmetic, developmental and phonetic. (See diagram.)

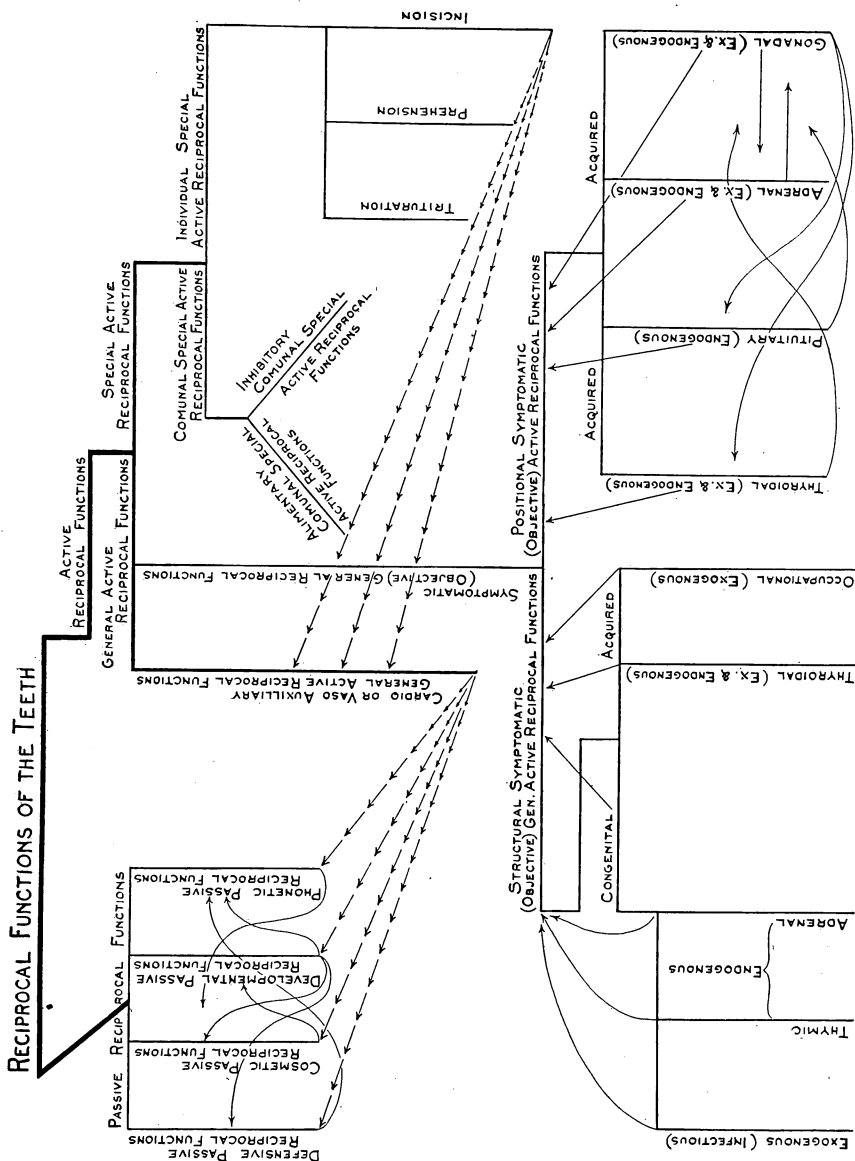


DIAGRAM SHOWING RECIPROCAL FUNCTIONS OF TEETH



**Defensive.** The Defensive depend upon the gross anatomy of the teeth, that is, they are so shaped as to prevent injury to the soft tissues surrounding and supporting them.

**Cosmetic.** The Cosmetic depend upon the gross anatomy, geometric harmony and the bio-chemistry of the teeth. They must be in harmony with other features of the face and by correct growth, influence the other features of the face to harmony, thus also partly exercising the developmental function.

**Phonetic.** The Phonetic depends upon the gross and microscopic anatomy of the teeth and their position relative to each other. That is, they must not only be of a shape and relation conducive to clear enunciation, but also of a texture insuring the proper degree of resonance or vibration. The latter part of this function we can unfortunately not restore by artificial means.

#### **Active Reciprocal Functions.**

The Active Reciprocal Functions of the teeth must be further classified into general and special.

**General Reciprocal Functions.** The General are cardio- or vaso-auxiliary and symptomatic.

The cardio- or vaso-auxiliary functions consists in the restimulating effect, which the mobility of the teeth has upon the circulation of the structures in which they are, and with which they are resiliently joined.

By virtue of this mobility, they induce a rhythmic intermittent pressure which, inimical to end tissue stasis, brings about a constant change of the nutrient elements traversing the nutrient channels of these tissues.

The Symptomatic must be subdivided into structural and positional.

The Structural Symptomatic may be indicative of some congenital or acquired constitutional anomaly such as (Hutchinson's teeth), thyroidal disbalance (as illustrated in teeth easily attacked by caries), or in the presence of a marked procreative urge, often bordering on lack of sexual equilibrium, as illustrated in cuspids of decided prominence and marked prehensile formation reflecting perhaps the animalistic trend of the individual in whom very frequently are also to be found small suprarenal bodies with narrow cortex, demonstrating perhaps a greater procreative and a lesser intellectual mission in the Cosmic scheme.

The Positional Symptomatic deal with the mal-position of different teeth in the maxillæ and mandible and are valuable diagnostic determin-



ators in that they thus unerringly point to pituitary, gonodial, thyroidal and adrenal disturbances which would otherwise be most obscure.

**Special  
Reciprocal  
Functions.**

The Special Active Reciprocal Functions of the teeth are communal and individual.

The Communal special reciprocal functions of the teeth are alimentary and inhibitory.

The Alimentary consist in the part they all play in the preparation of certain foods for the process of digestion.

The Inhibitory consist in the physical relationship of the teeth or their relative apposition mesio-distally in particular, so as to retard, or limit, the latero-rotary motion they acquire when in use.

The Individual are those of incision, prehension, mastication and trituration, and in the sequence enumerated, involve the incisors, cuspids, bicuspid and molars.

And since all functions are reciprocal, there can be no fixed rule or line of demarcation as to where one stops and the other begins.

All these enumerated, classified and dissected, present themselves vividly at some point, the height of the particular functional expression, to gracefully and gradually merge or lose themselves in those which follow.

Thus we have an interplay of parts devoid of harsh or interruptive demarcations. A pleasing harmony as expressed in co-ordinate effort, salubrious in effect; a song of work as marvelously planned as it is symphonically expressed in livingness, and yet more livingness to the glory of the mind that bade it come into being.

**Variations  
and Effects of  
Stress in Mastication.**

Incision, prehension, mastication or trituration are resultants of opposing forces as expressed in occlusal stresses of upper and lower teeth, or rather of lower against upper teeth.

The direction in which these stresses are exercised vary in these functions so that it must be definitely understood, that the stress which actuates the anterior teeth to incision, is not the same as the one which actuates the cuspids to prehension, and not the same which actuates the bicuspid in their prehensio-trituration function, and that the stress which actuates the molars to trituration is not the same as the one which actuates the other teeth to their particular functions, not the same either in intensity or direction.

**Incisal  
Stress.**

The stress which resolves itself in incision is exercised in an upward, outward and backward direction, against the upper incisors and results in an opposing stress downward, inward and forward

against the lower incisors, or gingivally and labio-distally in the upper incisors and gingivally and linguo-mesially in the lower incisors.

Upper cuspids are called upon to withstand a stress slightly upward, markedly outward and equally forward and backward, that is, gingivally and labio-mesio-distally.

**Cuspid  
Stress.**

This is balanced by the suspension ligament, the lips, the tongue, and the adjoining teeth.

The lower cuspids resist a pressure downward, inward, forward and backward; that is gingivally and linguo-mesio-distally.

This is balanced by the suspension ligament, the tongue and the adjoining teeth.

The upper bicuspid yield to a stress in an intra-alveolar, labio-distal and linguo-mesial, in an upward, outward and backward, and in an inward and forward direction, balanced by the suspension ligament, the cheeks, the tongue and the adjoining teeth.

**Bicuspid  
Stress.**

The lower bicuspid incur a stress markedly downward and inward, to a less degree down and backward and in a down and forward direction, or mainly gingivally and lingually intra-alveolar and to a less degree intra-distally and intra-mesially.

The upper molars yield to a stress in an upward, outward, backward, inward and forward direction (outward and backward predominating) or in an intra-alveolar, bucco-distal, bucco-mesial and palato distal direction, (bucco-distal predominating.) Here we see what may be considered a rotary yield to stress or what is more, an almost spheroidal yield in the exercise of function, balanced by the suspension ligament, the cheeks, the fibres of the buccinator muscles, the tongue, the adjoining teeth and in the last upper molar by the tuberosity.

**Molar  
Stress.**

The lower molars yield to a functional stress in the following direction. Markedly gingivally, markedly intra-bucco-distally and intra-linguo-mesially; and in a less degree intra-disto-lingually and mesio-buccally, or markedly downward, marked down and backward, down in and forward, and in a less degree down back and inward and down forward and outward.

All the foregoing data regarding stress exercised upon teeth in function are for teeth in nearly normal occlusion and with any marked deviation from the normal must come a study of the individual case and the stresses which the teeth may be subjected to when in use.

**Study  
Models.**

For the reason that cases requiring restorations known as bridgework rarely if ever present in normal occlusion, study models are absolutely essential to the man who undertakes the case. The architect who expects to build a shack, a bungalow, a cottage or a skyscraper has his plans to follow, all figured out to the minutest detail. The engineer who undertakes to build a railroad bed or a bridge knows to a bolt for every fishplate or to a rivet in every joint just what he is to do. An unforeseen emergency arising, he is better prepared to meet it properly and successfully if he had studied his plans than he would be if he were doing his work in a haphazard empiricism. A bricklayer has his line to follow; a mason his straight-edge; a die-maker and his depth-gauge are inseparable; a machinist and his blueprints or patterns are spoken of as one.

Study models should be the synonym for dentists, and those study models should be made from plaster impressions carefully taken. The casts or models should be carefully made of the hardest workable plastic substance obtainable, and these models should come in for a large share of the dentist's attention.

Each tooth should be carefully examined in the mouth and as carefully on the model. These models must be studied separately and in their relation to one another.

If but one tooth be missing and a restoration is to be undertaken, the care exercised in the examination of the model should be as equally thorough as if any number of teeth were involved.

If the second lower molar has been lost and a restoration is contemplated, the first and third molars will be involved in the construction and the upper second bicuspid as well as the three upper molars will be involved in occlusion.

**Involvement of Natural  
Teeth in Bridge work.**

The replacement of the first lower molar involves the second molar and second bicuspid in construction and the two upper bicuspid and first and second upper molars in occlusion.

The replacement of the second lower bicuspid involves the first lower bicuspid and first molar in construction and the upper cuspid, bicuspid and first molar in occlusion.

The replacement of the first lower bicuspid involves the lower cuspid and second bicuspid in construction, the upper lateral, cuspid and two bicuspid in occlusion.

The replacement of the lower cuspid involves the lower lateral and first and second bicuspid in construction and the upper central, lateral, cuspid and two bicuspid in occlusion.

The replacement of the lower lateral involves the lower central and



cuspid in construction and the upper central, lateral and cuspid in occlusion.

The replacement of the lower central involves the opposite lower central and the lateral adjoining the edentulous space in construction, and the two upper centrals and the lateral opposite the edentulous space in occlusion.

The replacement of the two lower centrals will involve the two lower laterals and cuspids in construction and the six anterior uppers in occlusion.

The replacement of the four lower incisors will involve the lower cuspids and first bicuspid and alveolar ridge in the construction and eight anterior upper teeth in occlusion.

The replacement of two lower bicuspid and first lower molar will involve the lower cuspid, second molar and alveolar ridges in construction and the upper lateral, cuspid, and two bicuspid, first and second molar in occlusion.

The replacement of two lower molars upon one side of the mouth, will involve either the lower cuspid and two bicuspid and alveolar ridge in construction and all upper teeth distally to the central on that side in occlusion, or may involve the second bicuspid and cuspid and alveolar ridge upon the edentulous side of the lower and the second molar upon the opposite side of the lower in construction and all the teeth distally to the upper central on one side and the three molars upon the other side of the upper in occlusion.

The replacement of the upper second molar will involve the first and third molars and palatine surface between them in construction, and the three lower molars on that side in occlusion.

The replacement of the upper first molar will involve the upper second bicuspid and second molar and the palatine surface between them in construction and the second lower bicuspid, first and second lower molar in occlusion.

The replacement of the upper second bicuspid will involve the first bicuspid and first molar in construction and the two lower bicuspid and first lower molar in occlusion.

The replacement of the upper first bicuspid will involve the upper cuspid and second bicuspid in construction and the lower cuspid, two bicuspid and first molar in occlusion.

The replacement of the upper cuspid will involve the lateral, first and second bicuspid in construction, and the lower lateral, cuspid, two bicuspid and first molar in occlusion.

The replacement of the upper lateral involves the upper central



and cuspid in construction and the lower central, lateral, cuspid and first bicuspid in occlusion.

The replacement of the upper central involves the other central and lateral adjacent to the edentulous space and the cuspid on that side in construction and the lower central, lateral, cuspid and first bicuspid in occlusion.

The replacement of the upper centrals involves the upper laterals and cuspids in construction and the eight anterior lower teeth in occlusion.

The replacement of the four upper incisors involves the upper cuspids and first bicuspid and the antero-palatine surface of the intermediate alveolar ridge in construction and the eight anterior lower teeth in occlusion.

The replacement of the upper two bicuspid and first molar involves the cuspid, second molar and the palatine surface of the intermediate alveolar ridge in construction and the lower teeth of that side distal to the lateral in occlusion.

The replacement of an upper central and lateral incisor will involve the central, lateral, and cuspid adjacent to the edentulous space in construction and the four lower incisors as well as the cuspid and first bicuspid on one side in occlusion.

The replacement of the upper molars on one side of the arch will involve the second and first bicuspid on that side and the first molar on the opposite side as well as the alveolar ridge including tuberosity on the edentulous side in construction, and all lower teeth distal to the cuspid on the side and the first and second molar on the opposite side in occlusion.

The replacement of the upper molars on both sides will involve the second bicuspid, cuspids and alveolar ridge, including the tuberosity, also the palate in construction, and all lower teeth distal to the four incisors in occlusion.

#### **Classification of Bridges.**

A bridge which involves one side of the mouth is a unilateral simple, or a unilateral compound bridge.

A bridge which involves both sides of the mouth is a bi-lateral complex bridge; and it must be remembered that the teeth which are directly concerned in the construction or occlusion of a bridge, indirectly influence all the other teeth in the mouth to a more or less limited degree, either favorably when the work has been properly executed, or unfavorably when the restoration is faulty.

An artificial restoration such as a piece of bridgework, can never be modified, or in any way influenced by its environment, but on the contrary it may exercise a powerful influence upon any environment in which it may be placed.



This influence may be a positive physiologic one or a positive pathologic one and it may be partly passive and partly active.

If the restoration has been constructed in full accord with all the requirements as enumerated and minutely set forth in the previous article and in the beginning of this, its influence upon its environment will be constructive, physiologic and restimulating.

If in the construction of the appliance some or all of the requirements have been ignored, its influence upon its environment will be patho-morphologic or destructive.

Without at this time going more deeply into the philosophy of the problem, it will suffice to record for future elucidation that these influences upon environment are active and passive; that is, we have active constructive and active destructive influences, and we have also passive constructive and passive destructive influences.

We must recall that bridgework has been defined, divided and classified into simple, compound, complex and cantilever, and it should not be difficult to convince ourselves of the truth of the following statements:

Of all bridges, a simple one may be most easily made conducive to the health of the patient.

A compound bridge presents greater difficulties in construction than a simple one, and yet both may be so made that their influence upon the patient's health will be wholly physiologic and restimulating.

A complex bridge presents greater difficulties in construction than a compound one, and yet it may be so made that it will be conducive to the health of the patient from every point of view.

A cantilever bridge presents by far the greatest difficulties in construction and never can be so made that its environmental influence shall be wholly physiologic.

This comes from the difficulty of limiting the vertical yield of the distal part of such bridges under stress and our inability to halt or arrest this stress before the elastic limit of the subjacent mucosa has been reached.

It is for this reason that the bugbear of resorption becomes a vexing factor in these types of restoration, and while it cannot be entirely obviated it may be limited to a great extent by painstaking attention to occlusion.

*The artificial teeth in these bridges must present occlusal surfaces which are exceedingly well defined and capable of dismemberment of food with the least expenditure of muscular effort and hence with but little saddle pressure upon the underlying mucosa. More of this at some future time.*



## Items of Interest

If we now recall the definition of a simple bridge, we can readily see why it would be the least difficult one to so construct, that it would be wholly conducive to the health of the patient and the realization is inevitably brought home to us by the process of association of ideas that it would be desirable if there were no others, that is, if all were simple bridges.

Next to having no need for bridges at all, it would be ideal if we never had any but simple bridges to construct, and since we have bridges, we may as well exclude the first condition for the present and accept for our ideal that bridge in which the abutments and the artificial substitute are subjected to a stress in the same or very similar direction during the exercise of function.

Forthwith we realize that this is an ideal not possible to reach in a great many cases, particularly the extensive ones, and in seeking to approach our ideal as nearly as we may, we do the next best thing; we compromise by making the compound, complex and cantilever bridge as simple as we can by the method of segregation.

In these instances it simply means the breaking or interrupting of transmission of stress, by providing limited mobility at definite points and in definite directions, the mobility provided being as intermittent as the stress of mastication.

Let us now go on to the consideration of a bridge restoration, known as a simple bridge. (To be continued).





## Some Principles of Retention.

By MARTIN DEWEY, M.D., D.D.S., Kansas City, Mo.  
*Read before the American Society of Orthodontists at Toronto.*

Some few weeks ago I wrote a paper on this subject and mailed it to the men who would discuss my paper, but since arriving at Toronto and listening to the discussion and the reading of other papers, I have decided to cut out about half of my talk and deal only with one phase of retention.

### **Fundamental Principle of Retention.**

Retention may be defined as "the application of force to maintain teeth in the proper position in the line of occlusion." At first glance, this definition may be considered contrary to everything we have been taught in the past in regard to retention.

I can remember when it was the common opinion among orthodontists that retention consisted in holding the teeth rigid in the line of occlusion until such a time as they might become firm. At the present time it is the application of force to maintain the teeth in the proper position with the line of occlusion, and we may say that this application of force is derived from two sources. These sources are mechanical and natural.

### **Mechanical Force in Retention.**

Mechanical forces of retention are "such forces as are exerted by mechanical devices. These mechanical devices are divided into active and passive. The passive mechanical retention is the first form of retention that we knew anything about, and is that form which was employed when teeth were held rigid. It is based upon the opinion that in order that a tooth might become firm it must be held rigid. After at-

tempting that plan of retention for a number of years it was found that the longer a tooth was held rigid the longer it remained loose. That is, the tissue which should support the tooth will not develop if the tooth is held absolutely rigid by a mechanical device. It has long been a law in the retention of the teeth to antagonize them in the backward direction only. Now, the important factor is the application of some mechanical device which will antagonize this backward tendency. Several years ago Dr. Watson presented a paper before the American Society of Orthodontists on "Retention," in which he outlined conditions as they existed at that time, and made the statement that orthodontists were confronted with the problem that they could move teeth, but they could not hold them. In other words, the regulating appliance had advanced farther than the retaining appliance.

**Active Force  
in Retention.**

About that time Dr. Watson and several others advocated the use of the intermaxillary rubber for the retention of Class 2 cases, and that was the beginning of active retention. So at the present time active retention, or an active retaining appliance, is one which exerts a force to overcome the backward tendency of the tooth. This force is exerted by having some sort of appliance which is active. This may be a spring from a lingual arch, or it may be a pull from an intermaxillary rubber, and whichever method it is, is the reverse to the methods, or ideas held in times past. However, active mechanical retention is far superior to passive mechanical retention, because it has been proven that in order for a part to develop it must be used. The gradual stimulating influence which is exerted upon a tooth by an active mechanical device causes the part to develop much more rapidly than it would if no such force were exerted. In other words, the use of an active retaining device stimulates the natural forces of retention, which is the same as the natural forces of occlusion. We have all recognized for a great many years the importance of the force of the inclined plane as a factor in retention and as a force in occlusion, but it is only one small part of the story.

**Force of  
Approximal  
Contact.**

Associated with the force of the inclined plane is the force of approximal contact, which is the force exerted between the teeth of one arch upon the approximating teeth of the same arch. The force of the approximal contact is only a small point, and the teeth must be carefully placed so that this approximal contact will be normal. It is possible to have a normal locking of the inclined plane and still have an abnormal approximal contact. This has occurred in the Class 2 cases, where the lower teeth have been tipped excessively. We



had a normal mesio-distal relation of the cusps, at least probably not a normal occlusal relation, but the approximal contacts were abnormal because they did not occupy the proper relation to each other. Another example may be found in the lower cuspids, or any of the lower anterior teeth, which may have a proper occlusal inclined plane relation, but the approximal contact may not be exactly right, and one of the other teeth will slip out of the line of the arch.

**Force of  
Muscular Pressure.**

Another force which holds the teeth in the proper position is muscular pressure, understood by all of us. Now, muscular pressure, or muscles of the lips and cheeks and the tongue, not only hold the teeth in their proper positions, but those muscles must act normally in order that the bone may develop properly around those teeth. There must be not only a normal action of the muscles of respiration and muscles of mastication, but everything concerning the mandible and the maxillæ in the way of a muscular action must be normal. Not only must the lips be held in contact during the entire time, but the muscles of respiration, or those muscles which depress the mandible, must also be normal, and the action of the tongue must be normal in order to maintain the width of the upper and lower arch.

**Atmospheric  
Pressure.**

Atmospheric pressure is another factor which has to do with retention, and which necessarily is closely associated with muscular activity. There has been so much said about harmony in the size of the arches as a force of occlusion that it hardly need be mentioned as a force in retention.

**Cell  
Metabolism.**

Now, the last force of retention to be considered is cell metabolism, which, to a certain extent, depends upon all the other forces which I have mentioned, and which is responsible for the success of the case. We may have all the other factors absolutely normal, or as near normal as we can get them, but if cell metabolism does not respond as it should, the case will be a failure. Dr. Noyes has said that the permanent retaining device consists of spiculæ of bone and fibres of the periodontal member. They are the result of cell metabolism, and cell metabolism is the result of all these other forces.

**Bone  
Development  
in Retention.**

There has been a great deal said, recently, in regard to the development of bone as a factor in retention, or in regard to the development of bone as being responsible for the permanent position of the teeth. There is no doubt but that there are various means of causing and stimulating growth of bone around the teeth,

but it must be remembered that if the growth of the bone is the result of the regulating appliance, or the retaining appliance, that it will be absolutely useless so far as retaining is concerned. It has been shown in the movement of the teeth that spiculæ of bone will develop and respond to mechanical stimulation. Therefore, it becomes necessary that if the bone is developed as the result of the regulating appliance, those spiculæ of bone must be made to develop in exactly the same manner as they would develop as the result of the forces of mastication and use. You may adjust a very beautiful appliance, move your teeth bodily, move the apices of the teeth and get a development of bone, which development will be true bone so far as the histological structure is concerned. But the spiculæ of bone must not be arranged to withstand the stress of mastication, but rather to withstand the stress of the regulating appliance, and as a result of the stress of the regulating appliance. A similar retaining appliance may be put on, which will continue to develop that bone, but as soon as the appliance is removed, and the teeth receive the stress of mastication, which is a different stress from the one we had from the appliance, the bone, which had been developed, will be absorbed again.

**Opening the  
Suture.**

In the experiments which I have been carrying on with dogs in relation to opening the intermaxillary suture, I have progressed so far with some of them that I have opened the suture and shown, by radiographs, that the space is filled with bone. I say this is bone because in those we have killed and examined, we have found that the tissue is bone. I have removed the regulating appliance, and the teeth have immediately returned to their old positions as the result of the absorption of the tissue which had been built into the intermaxillary suture, and this absorption has occurred as a result of the stresses of mastication, being different from the stress of the retaining appliance, or the regulating appliance. I believe if those teeth had been held apart for years, when the appliance was removed, the return to the old position would have been just as rapid, because the bone was developed as the result of unnatural force. Also, the force of muscular pressure and force of the inclined plane was abnormal, which, of course, would cause the bone to be absorbed.

In closing, I will say that the solution of retention lies in the construction of a mechanical device, which will allow the teeth to respond to all of the stress of mastication. The teeth must be held loosely and so as to antagonize the back direction, which can be done by some form of appliance which will allow them to move, as the result of the stress of mastication. Furthermore, the solution of retention does not lie in the

stress of bone development, but lies in obtaining a normal action of all the forces of occlusion, and this normal action can only be obtained by the use of appliances that will not interfere with mastication. Also, that permanency in retention depends upon the normal action of natural forces of retention, and the sooner we become familiar with the natural forces of retention and with what these forces will do, the sooner will we have permanent results, and not be compelled to see our cases relapse, as we have in times past.

### Discussion of Dr. Dewey's Paper.

I am rather at a disadvantage in discussing Dr. Dewey's paper, because his lecture has been materially different from the written paper which he furnished me.

**Dr. Eloyd S. Lourie,**  
**Chicago.**

There are one or two points I noted while he was speaking that I want to refer to and one is this: He says it is impossible to retain the teeth if cell metabolism is faulty or if we have insufficient tissue development. That might account for one of the difficulties many of us have had in connection with retention. We make a mistake in undertaking treatment when it is practically a physical impossibility because of being hampered with faulty cell metabolism and insufficiency of tissue to accommodate the changes we wish to make, and for the same reason I would take issue with the statement that there is no question about getting bone development where we wish it. Dr. Dewey may be able to do that, and if he is able to do it, I would like him to give us a carefully prepared paper explaining just how he can get bone development where and when he wishes and to any extent he desires, because I cannot accomplish what I wish in the way of bone growing, and there are some things I will not undertake because I realize my limitations in that respect.

I wish heartily to indorse the main point of Dr. Dewey's paper, which is this: It is necessary not only to get the teeth into normal occlusion or normal contact and cusp relation but to get all the forces which influence the teeth in normal correlation as far as possible. It is not always possible to get all of these forces working normally, and I thought of that particularly in listening this morning to the paper of Dr. Grieves when he explained those factors that influenced bone development over which we have absolutely no control. We may get all the factors influencing occlusion over which we have any control into good normal condition, and yet fail because of other factors influencing growth and development over which we have no control.

The second point of the paper points out very clearly that it is necessary to construct retaining appliances in such a way as to allow freedom of tooth motion. That is quite important. The appliance should be so arranged that the teeth can respond to the natural impact of occlusal and muscular force. I may say here that it is almost impossible, so far as I have been able to learn, to devise a retainer that will absolutely do this. We simply have to select an appliance that offers the least hindrance to normal function and then eliminate it as soon as it is possible to do so, substituting the natural forces of retention. But we must also remember that we cannot retain a tooth mechanically for any preconceived length of time and remove the retainers and expect Nature to do the rest. It has been too commonly the custom to consider our active work in treatment finished when the retaining appliances are put on, and that all we need to do is to see that these retaining appliances stay in place during the prescribed length of time. But our efforts will not be attended with success unless during the time the appliances were being worn the natural forces of retention were being developed. That is a line of thought upon which we can well expend a good deal of effort in determining how we can best develop muscular balance for one thing and general tone and vigor for another, to assist mechanical retention.

I am in the same position with Dr. Lourie, in  
**Dr. Frank M. Casto,** that I cannot see very much relation between the  
**Cleveland.** paper by Dr. Dewey and his talk, although both  
have been quite interesting to me.

We all agree with Dr. Dewey that retention is one of the most important parts of the orthodontic procedure. In fact, it is the final word in every case. No matter how beautiful the results of the operative procedure may be, if the retention is not properly cared for there will be untimely failure.

There is one other point in connection with retention which must be considered, and that is growth during the retaining period. A rigid retaining appliance should never be placed for a long period during the time of development. There are many forms of adjustable appliances which can be used in such cases.

I would like to say also that I believe in the use of removable retaining appliances. There are many cases where they are a distinct advantage, especially in the latter part of the retention. Let me also mention the use of a plate. In some cases where the upper incisors have been moved lingually and you wish to hold these indefinitely, it can be done by the use of a plate with a labial wire. Many patients will willingly wear such a retainer a part of the time, at night, and it

is just as effective. It allows also for any individual tooth movement and does not interfere with the function.

**Dr. Ottolengui.**

Will you please tell us how you place the wire?

**Dr. Easto.**

I vulcanize it in the plate. I bring it over, as a rule, between the first bicuspid and cuspid, fitting it close between the two teeth just in the anterior region, that is, in cases where I have made expansion of the arch and also wish to hold the anterior teeth.

I wish to impress again the importance of function. We must have function of the teeth in order to have a healthy condition and development, and the appliances must not interfere with this.

**Dr. Federspiel.**

It may seem ignorant on my part, but I do not quite understand what is meant by cell metabolism. I wish Dr. Dewey would make that clear to me.

**Dr. Kemple.**

I did not catch the meaning of Dr. Dewey's remarks in regard to the development of the mandible. If I understood him, he referred to the relation between the underlying bones and the dental arch.

**Dr. Dewey.**

By cell metabolism I mean cell growth, and cell growth is the basis of all development. If you move a tooth you must get normal action of cells which fill the periodontal membrane and alveolar process which keep on building. There are various things which interfere with that, as has been shown to-day, but you must remember them.

Dr. Kemple asked what I meant by developing the underlying structures supporting the dental arch and alveolar process. I mean the body of the mandible will develop as a result of the normal forces of occlusion and the normal forces of retention. The receding chin and underdeveloped mandible you get in the lower arch associated with mouth breathing as the result of the abnormal stress of respiration. The mandible has various functions, one of which is the function of respiration which is controlled or influenced by the muscles from the hyoid to the mandible. The mandible has function in speech, and according to a great many investigators, the reason man has a greater chin than the ape is because man talks. When you change a set of teeth from malocclusion to normal, the normal action of the muscles of respiration causes the chin in man to develop. If you move the lower teeth forward bodily and set them in proper position, they will cause the mandible to develop. I can show you photographs of patients before and after, showing that the mandible has increased in length.

**Dr. Kemple.**

May not that be changed in relation to the temporo-mandibular articulation?

**Dr. Dewey.** You cannot change the temporo-mandibular articulation.

**Dr. Kemple.** How about all the Class II and III cases that have been treated?

**Dr. Dewey.** I can show you a few X-rays of such cases in which it has not changed. I can show you X-rays that point out that after these conditions have been treated they are the same as before. The temporo-mandibular articulation anatomically is surrounded by ligaments so that the mesio-distal relation cannot change.

**Dr. Kemple.** Yesterday I showed the model of a case of a young lady, twenty-two years of age. It was decidedly a Class III condition. At least, all the lower incisors and cuspids closed mesially to the upper cuspids, and that relation was changed within six months without any apparent tipping of the upper incisors. Do you mean to tell me you can produce sufficient growth of bone in that length of time to account for that change, if the mandible has not slipped back in the temporo-mandibular articulation? The maxilla must be moved forward. Does such growth of bone take place in that comparatively short time?

**Dr. Dewey.** I cannot say it did in that case, but it would be possible for it to do so. There is no reason why bone should not grow as rapidly in the region of the teeth and alveolar process as anywhere in the body. We know that after a surgical operation bone tissue will fill in the space in a comparatively short time. The reason it takes so long before it develops around teeth is because abnormal conditions are present. There are few cases of Class III which are the result of luxation, where the mandible is moved forward accidentally and which may return to a normal position as the result of treatment. In Class II cases, or distal relation of the lower teeth, I do not think the condyle moves forward, and if it does you do not want it to, because I do not believe you can hold it there.

**Dr. Young.** If you take a child, eight years of age, with a Class II condition, widen the upper arch, put nothing on the lower arch, and simply make an attachment to the first cuspid and first permanent molar on each side to carry a lingual arch and to keep the expansion, how do you account for the fact that the lower teeth move into normal occlusion if there is no change in the temporo-mandibular articulation?

**Dr. Dewey.** The articulation remains unaltered, the condyles slide back, and the mandible moves forward. The condyle will slip backward coincidentally with the development of the body of the mandible. My contention is you cannot keep the condyle forward in its normal position.

**Dr. Kemple.** Is it not possible to establish a new seat for the mandible in that joint, just as they make a new hip-joint in the Lorenz operation?

**Dr. Dewey.** It might be, but I do not think you would ever do it. Anything is possible.

**Dr. Kemple.** Is not the Lorenz operation a successful one?

**Dr. Dewey.** It is in some cases, but it is not the establishment of a new joint. I do not think you can say that in the Lorenz operation a new joint is

established.

**Dr. Ottolengui.** I do not think it is quite fair to compare those two operations establishing a new hip-joint and changing the position of the condyle. You have all of you seen thrown on the screen pictures of skulls, and the lecturer has said, "this is the skull of a child at the age of three months, observe the glenoid region. This is the skull of a child at six months, and this the skull of a child at ten months," but, as a matter of fact, you can find all of the normal variations in some degree in young children, and sometimes at a very early age, you may have a deep fossa and a high eminence and the position of the condyle could not be changed unless you cause resorption of the eminence. But it is my conception that in some children the eminence is so flat at the time of operation, that it may be possible to hold the mandible forward long enough so that the glenoid fossa will assume such shape as will establish the position permanently. This is pure speculation on my part, but it has been my experience, as Dr. Young pointed out, that in some instances without any help whatever the mandible will slide forward and remain there. In other instances it will go back in spite of long retention.

**Dr. Dewey.** My opinion is based on comparative embryologic and anatomic evidence. The anatomic evidence is based on examinations of skulls I could find or hear of that showed Class II and Class III conditions. In distal relation of the lower arch the mastoid process, the external auditory meatus, and the condyles occupy the same relation. Then you will find cases in which the shape of the condyle does change as a result of the abnormal occlusion. You may compare the mesiodistal relation of the condyle with those other landmarks in the same position, but the shape is different. In the case Dr. Young mentioned, where the mandible moves as the upper arch is widened, the mandible moves forward as the result of muscular effort, but the condyle is brought back to its old position by lengthening of the body of the mandible in a short time, say in two or three weeks. The action of the tongue on the lower anterior teeth will cause the body of the mandible to move forward or to lengthen; but in asking these questions you are getting off the question of retention which is another proposition.



## **Blood Findings in 162 Consecutive Cases of Chronic Oral Infection Associated with Teeth.**

By WM. H. G. LOGAN.

*Read before the Panama-Pacific Dental Congress, San Francisco, California,  
Section VI, September 1, 1915.*

Since most persons over forty years of age having natural teeth are believed to be afflicted with local areas of chronic oral infection, involving either the periapical or gingival pericemental and alveolar structures, and because we have scientific evidence of such a conclusive nature that pronounced systemic effects may result from periodental focal infections presented to the profession by Hunter in 1900, Kenneth Goadby in 1911, Billings, Davis, Nicol, Rosenow and Liebman in 1912 and Hartzell in 1914; and because it is the belief of a vast number of close observers that most of such patients remain free from disease that can be traced to oral focal infections, to the end that they are inclined to wait until the patient shows pronounced secondary infections before demanding the eradication of these foci; yet, because of the pathologic dictum, that in the presence of lowered resistance secondary involvements are most likely to occur from chronic infections, it has become essential to ascertain the usual blood findings in consecutive cases of oral sepsis to determine whether valuable information could be collected, which would be of benefit in reaching a decision that a chronic oral infection, though apparently producing no secondary effects, may in reality be sufficiently active to produce characteristic blood changes, which would be of diagnostic aid in deciding in favor of treating the infected

foci with retention of the teeth, or demanding immediate extraction and possibly curettement of the area.

Before discussing the case records, I desire to call attention to the fact that they are all of patients presenting at my office; therefore, these reports should not be compared with those secured from patients confined to the hospital from ill health.

I herewith report on the blood findings\* in 162 consecutive cases of chronic oral infection associated with teeth, of which 110 are advanced pyorrhea cases where the clinical evidence of pus was present, and in ninety-six per cent. of the cases some teeth had been lost or were so seriously involved with the disease that extraction was demanded. The remaining fifty-two cases are of patients having chronic periapical infection without evacuating sinuses; however, eighteen cases had pyorrhea co-existing. For the convenience of study, I have divided them into the following six groups:

1. Pyorrhea cases with fair to normal blood count, reporting five typical cases of the sixty-two belonging to this group.

2. Pyorrhea cases with fair to normal hemoglobin content and erythrocyte count and slight leucopenia present, reporting five typical cases of the thirty-one belonging to this group.

3. Pyorrhea cases where the pockets extended into the periapical area with fair to normal hemoglobin content and erythrocyte count and slight to moderate leucocytosis present, reporting five typical cases of the seventeen belonging to this group.

4. Cases of chronic periapical infection not having evacuating sinuses, with pyorrhea co-existing and with fair to normal hemoglobin content and erythrocyte count and slight to moderate leucocytosis present, reporting five typical cases of the nineteen belonging to this group. Also reporting under this group the single case of pronounced anemia presenting in the entire series.

5. Cases of chronic periapical infection not having evacuating sinuses and the body thought to be free from all other focal infective processes, with fair to normal hemoglobin content and erythrocyte count and slight to moderate leucocytosis present, reporting ten typical cases of the twenty-nine belonging to this group.

6. Cases of chronic periapical infection not having evacuating sinuses and the body thought to be free from all other focal infective processes, with fair to normal hemoglobin content and erythrocyte count and moderate leucopenia present, reporting two typical cases of the four belonging to this group.

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\*These examinations were never taken for some hours after the patient had partaken of a hearty meal.

# Items of Interest

## Group 1.

Pyorrhea cases with fair to normal blood count, reporting five typical cases of the sixty-two belonging to this group.

### Hemanalysis.

<b>Case 17.</b>	Mrs. H. June 24, 1914. Age 38.	<b>Case 6.</b>	Mrs. D. April 10, 1914. Age 59.
*Hemoglobin .....	85%	.....	90%
**Erythrocytes .....	4,472,000	.....	4,772,000
**Leucocytes .....	7,800	.....	7,400
Polymorphonuclears ...	64%	.....	65%
Large Mononuclears...	4%	.....	4%
Small Mononuclears...	32%	.....	31%
Eosinophiles .....	0	.....	0
Systolic .....	132	.....	140
BLOOD PRESSURE. Diastolic..	90	.....	98
(Tycos)			
Pulse pressure...	42	.....	42
Teeth lost from pyorrhea..	3	.....	4
Teeth extensively involved..	28	.....	22
<b>Case 128.</b>	Mr. H. March 28, 1915. Age 59.	<b>Case 26.</b>	Mr. F. May 27, 1914. Age 58.
Hemoglobin .....	97%	.....	90%
Erythrocytes .....	5,088,000	.....	4,712,000
Leucocytes .....	7,000	.....	7,000
Polymorphonuclears .....	63%	.....	65%
Large Mononuclears.....	9%	.....	2%
Small Mononuclears.....	26%	.....	31%
Eosinophiles .....	2%	.....	2%
Systolic .....	132	.....	153
BLOOD PRESSURE. Diastolic..	100	.....	105
Pulse pressure...	32	.....	48
Teeth lost from pyorrhea..	6	.....	8
Teeth extensively involved..	25	.....	21

\*Sahli.

\*\*Per cu. mm.

**Case 24.** Mrs. N. May 13,  
1915. Age 44.

Hemoglobin .....	80%
Erythrocytes .....	4,408,000
Leucocytes .....	7,000
Polymorphonuclears .....	65%
Large Mononuclears .....	4%
Small Mononuclears .....	30%
Eosinophiles .....	1%
Systolic .....	114
BLOOD PRESSURE. Diastolic..	80
Pulse pressure...	34
Teeth lost from pyorrhea..	1
Teeth extensively involved..	29

**Group 2.**

Pyorrhea cases with fair to normal hemoglobin content and erythrocyte count and slight leucopenia present, reporting five typical cases of the thirty-one belonging to this group.

**Hemanalysis.**

**Case 11.—A.** Mrs. G. M. April 6,  
1914. Age 46.

Hemoglobin .....	80%
Erythrocytes .....	4,488,000
Leucocytes .....	6,000
Polymorphonuclears .....	60%
Large Mononuclears .....	5%
Small Mononuclears .....	35%
Eosinophiles .....	0
Systolic .....	114
BLOOD PRESSURE. Diastolic..	80
Pulse pressure...	34
Teeth lost from pyorrhea..	5
Teeth extensively involved..	21

**Case 11.—B.** Second examination.  
May 7, 1915.

.....	94%
.....	4,632,000
.....	8,000
.....	61%
.....	6%
.....	32%
.....	1%

Second blood examination made some months after infection was controlled.

# Items of Interest

<b>Case 67.</b>	Mrs. F. Nov. 12, 1914. Age 39.	<b>Case 119.</b>	Mrs. A. March 1, 1915. Age 33.
Hemoglobin .....	87%	.....	92%
Erythrocytes .....	4,552,000	.....	4,308,000
Leucocytes .....	6,400	.....	6,600
Polymorphonuclears .....	63%	.....	63%
Large Mononuclears.....	5%	.....	7%
Small Mononuclears.....	32%	.....	30%
Eosinophiles .....	0	.....	0
Systolic .....	125	.....	120
BLOOD PRESSURE. Diastolic..	94	.....	90
Pulse pressure...	31	.....	30
Teeth lost from pyorrhea..	3	.....	2
Teeth extensively involved..	19	.....	15
<b>Case 135.</b>	Mrs. P. Sept. 19, 1914. Age 57.	<b>Case 65.</b>	Mrs. S. Oct. 27, 1914. Age 62.
Hemoglobin .....	88%	.....	88%
Erythrocytes .....	4,024,000	.....	4,640,000
Leucocytes .....	5,600	.....	6,600
Polymorphonuclears .....	54%	.....	58%
Large Mononuclears.....	4%	.....	9%
Small Mononuclears.....	39%	.....	31%
Eosinophiles .....	3%	.....	2%
Systolic .....	130	.....	120
BLOOD PRESSURE. Diastolic..	90	.....	92
Pulse pressure..	40	.....	28
Teeth lost from pyorrhea..	5	.....	15
Teeth extensively involved..	15	.....	9

## Group 3.

Pyorrhea cases where the pockets extended into the periapical area, with fair to normal hemoglobin content and erythrocyte count and slight to moderate leucocytosis present, reporting five typical cases of the seventeen belonging to this group.

**Hemanalysis.**

<b>Case 77.—A.</b>	Miss L. April 10, 1914. Age 46.	<b>Case 77.—B.</b>	Second examination. June 18, 1914.
Hemoglobin .....	83%	.....	87%
Erythrocytes .....	4,392,000	.....	4,384,000
Leucocytes .....	9,000	.....	7,000
Polymorphonuclears .....	65%	.....	65%
Large Mononuclears.....	7%	.....	8%
Small Mononuclears.....	25%	.....	27%
Eosinophiles .....	3%	.....	0
Systolic .....	120		
BLOOD PRESSURE. Diastolic..	84	Second examination made some months after infection was con- trolled.	
Pulse pressure..	36		
Teeth lost from pyorrhea..	3		
Teeth extensively involved..	20		
Pockets involving root ends.	3		

<b>Case 8.</b>	Mrs. G. April 15, 1915. Age 52.	<b>Case 10.</b>	Mr. R. April 14, 1914. Age 58.
Hemoglobin .....	90%	.....	99%
Erythrocytes .....	4,856,000	.....	4,744,000
Leucocytes .....	8,400	.....	8,800
Polymorphonuclears .....	66%	.....	63%
Large Mononuclears.....	8%	.....	7%
Small Mononuclears.....	26%	.....	30%
Eosinophiles .....	0	.....	0
Systolic .....	136	.....	160
BLOOD PRESSURE. Diastolic..	92	.....	120
Pulse pressure..	44	.....	40
Teeth lost from pyorrhea..	5	.....	5
Teeth extensively involved..	15	.....	15
Pockets involving root ends.	3	.....	5

<b>Case 37.</b>	Mr. F. July 1, 1914. Age 49.	<b>Case 71.</b>	Mrs. E. Nov. 19, 1914. Age 43.
Hemoglobin .....	90%	.....	92%
Erythrocytes .....	4,424,000	.....	4,928,000
Leucocytes .....	8,200	.....	8,200

# Items of Interest

(Case 37 continued)

(Case 71 continued)

Polymorphonuclears .....	67%	.....	67%
Large Mononuclears.....	6%	.....	4%
Small Mononuclears.....	26%	.....	28%
Eosinophiles .....	1%	.....	1%
Systolic .....	118	.....	120
BLOOD PRESSURE. Diastolic..	84	.....	89
Pulse pressure..	34	.....	31
Teeth lost from pyorrhea..	2	.....	3
Teeth extensively involved..	18	.....	19
Pockets involving root ends.	2	.....	2

## Group 4.

Cases of chronic periapical infection not having evacuating sinuses, with pyorrhea co-existing and with fair to normal hemoglobin content and erythrocyte count and slight to moderate leucocytosis present, reporting five typical cases of the eighteen belonging to this group.

## Hemanalysis.

<b>Case 70.—A.</b>	Miss A. Nov. 16, 1914. Age 63.	<b>Case 70.—B.</b>	Second examination. Dec. 14, 1914.
Hemoglobin .....	81%	.....	88%
Erythrocytes .....	4,344,000	.....	4,368,000
Leucocytes .....	9,600	.....	7,400
Polymorphonuclears .....	69%	.....	66%
Large Mononuclears.....	7%	.....	7%
Small Mononuclears.....	23%	.....	26%
Eosinophiles .....	1%	.....	1%
Systolic .....	136		
BLOOD PRESSURE. Diastolic..	102		
Pulse pressure..	34		
Teeth lost from pyorrhea..	3		
Teeth extensively involved..	13		



Fig. 1.

Periapical infection about second bicuspid as shown in Fig 1.  
The normal blood count shown in the second examination was

brought about by treatment of the periapical infection through the root canal. The blood count did not change to normal with the pyorrhea treatment.

**Case 28.** Mr. M. June 1, 1914.  
Age 44.

Hemoglobin .....	97%
Erythrocytes .....	4,800,000
Leucocytes .....	9,800
Polymorphonuclears .....	66%
Large Mononuclears .....	4%
Small Mononuclears .....	30%
Eosinophiles .....	0
Systolic .....	143
BLOOD PRESSURE. Diastolic..	106
Pulse pressure...	37
Teeth lost from pyorrhea..	2
Teeth extensively involved..	23
Periapical infections..I..	moderate

**Case 72.** Mr. S. Nov. 23, 1914.  
Age 59.

.....	93%
.....	4,736,000
.....	13,000
.....	75%
.....	2%
.....	22%
.....	1%
.....	116
.....	90
.....	26
.....	7
.....	23
.....	2..moderate

**Case 110.—A.** Mrs. W. Feb. 19,  
1915. Age 53.

Hemoglobin .....	97%
Erythrocytes .....	4,768,000
Leucocytes .....	9,000
Polymorphonuclears .....	67%
Large Mononuclears .....	7%
Small Mononuclears .....	25%
Eosinophiles .....	1%
Systolic .....	120
BLOOD PRESSURE. Diastolic..	80
Pulse pressure...	40
Teeth lost from pyorrhea..	3
Teeth extensively involved..	15

**Case 110.—B.** Second examination.  
April 9, 1915.

.....	91%
.....	4,536,000
.....	7,000
.....	58%
.....	6%
.....	33%
.....	3%

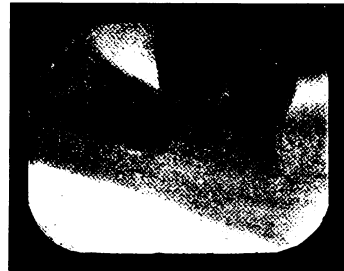


Fig. 2.

Infection about impacted tooth shown in Fig. 2.

# Items of Interest

Pyorrhea not treated in this case—the imbedded bicuspid was removed and the infected area curetted. The blood count returned to normal with the presence of pyorrhea as shown by the second examination.

<b>Case 96.—A.</b>	Miss G. Jan. 15, 1915. Age 31.	<b>Case 96.—B.</b>	Second examination. June 16, 1915.
Hemoglobin .....	91%	.....	90%
Erythrocytes .....	4,556,000	.....	4,456,000
Leucocytes .....	13,400	.....	7,800
Polymorphonuclears .....	73%	.....	62%
Large Mononuclears.....	5%	.....	2%
Small Mononuclears.....	22%	.....	36%
Eosinophiles .....	0	.....	0
Systolic .....	120		
BLOOD PRESSURE. Diastolic..	85	Second blood examination was	
Pulse pressure...	35	made after the infection was	
Teeth lost from pyorrhea....	none	brought under control.	
Teeth extensively involved...	10		
Periapical infections...1..	moderate		

<b>Case 175.</b>	Dr. Y. Age 44.				
	Aug. 15, 1913	Aug. 25	Sept. 15	Sept. 20	
Erythrocytes.....	2,300,000	1,500,000	3,200,000	3,800,000	
	Oct. 10	Nov. 10	Nov. 25	Dec. 19	
" .....	4,000,000	4,028,000	4,300,000	4,700,000	

Periapical infections.... 1 ....moderate, and advanced pyorrhea. Tooth extracted and area curetted, and pyorrhea treated during the month of October.

This pronounced case of anemia was held by the various physicians in charge to be due to the oral sepsis associated with his teeth. The patient at the present time is in reasonably good health and carrying on his practice of medicine and surgery as formerly.

## Group 5.

Cases of chronic periapical infection not having evacuating sinuses and the body thought to be free from all other focal infective processes, with fair to normal hemoglobin content and erythrocyte count and slight

to moderate leucocytosis present, reporting ten of the twenty-nine belonging to this group.

### Hemanalysis.

**Case 106.—A.** Miss G. Feb. 12, 1915.  
Age 46.

Hemoglobin .....	91%
Erythrocytes .....	4,456,000
Leucocytes .....	11,200
Polymorphonuclears .....	74%
Large Mononuclears.....	2%
Small Mononuclears.....	24%
Eosinophiles .....	0
Systolic .....	138
BLOOD PRESSURE. Diastolic..	100
Pulse pressure...	38

**Case 106.—B.** Second examination.  
April 21, 1915.

.....	96%
.....	4,784,000
.....	7,000
.....	61%
.....	5%
.....	32%
.....	2%

Area of chronic infection about impacted cuspid shown in Fig. 3. Impacted tooth removed and area curetted, February 12, 1915.



Fig. 3.

**Case 54.—A.** Mr. P. Sept. 28, 1914.  
Age 23.

Hemoglobin .....	89%
Erythrocytes .....	4,640,000
Leucocytes .....	14,200
Polymorphonuclears .....	79%
Large Mononuclears.....	5%
Small Mononuclears.....	16%
Eosinophiles .....	0

**Case 54.—B.** Second examination.  
Nov. 2, 1914.

.....	96%
.....	5,016,000
.....	7,000
.....	65%
.....	5%
.....	30%
.....	0

Periapical infections.... 1 ....moderate.

Tooth removed and area surgically treated September 28, 1914.

# **Items of Interest**

<b>Case 78.</b>	Mr. G. Dec. 31, 1914. Age 56.	<b>Case 120.</b>	Miss D. Mar. 2, 1915. Age 35.
Hemoglobin .....	94%	.....	92%
Erythrocytes .....	4,816,000	.....	4,472,000
Leucocytes .....	8,800	.....	8,800
Polymorphonuclears .....	64%	.....	68%
Large Mononuclears.....	4%	.....	6%
Small Mononuclears.....	30%	.....	26%
Eosinophiles .....	2%	.....	0
Systolic .....	130	.....	132
BLOOD PRESSURE. Diastolic..	92	.....	100
Pulse pressure...	38	.....	32
Periapical infections..2..	moderate	.....	1..slight
 <b>Case 143.</b>	 Mr. W. April 21, 1915. Age 50.	 <b>Case 145.</b>	 Mrs. R. April 25, 1915. Age 49.
Hemoglobin .....	97%	.....	97%
Erythrocytes .....	4,776,000	.....	4,688,000
Leucocytes .....	11,600	.....	9,000
Polymorphonuclears .....	74%	.....	68%
Large Mononuclears.....	7%	.....	7%
Small Mononuclears.....	18%	.....	24%
Eosinophiles .....	1%	.....	1%
Systolic .....	138	.....	128
BLOOD PRESSURE. Diastolic..	96	.....	90
Pulse pressure...	42	.....	38
Periapical infections..2..	slight	.....	38
I..	moderate	.....	1..slight
 <b>Case 81.—A.</b>	 Mrs. S. Jan. 7, 1915. Age 49.	 <b>Case 81.—B.</b>	 Second examination. Jan. 18, 1915.
Hemoglobin .....	89%	.....	95%
Erythrocytes .....	4,586,000	.....	4,776,000
Leucocytes .....	11,200	.....	8,800
Polymorphonuclears .....	70%	.....	64%
Large Mononuclears.....	4%	.....	5%

(Case 81a continued)

Small Mononuclears..... 25%  
 Eosinophiles ..... 1%  
     Systolic ..... 124  
 BLOOD PRESSURE. Diastolic.. 90  
     Pulse pressure... 34

(Case 81b continued)

..... 30%  
 ..... 1%

Periapical infections. . . . I . . . .  
 moderate as shown in Fig. 4. Sec-  
 ond blood examination was made  
 eleven days after the cavity was  
 curetted.



Fig. 4.

**Case 68.—A.** Mr. T. Nov. 14, 1914.  
Age 61.

Hemoglobin ..... 90%  
 Erythrocytes ..... 4,832,000  
 Leucocytes ..... 12,800  
     Polymorphonuclears ..... 73%  
     Large Mononuclears..... 4%  
     Small Mononuclears..... 22%  
     Eosinophiles ..... 1%  
     Systolic ..... 137  
 BLOOD PRESSURE. Diastolic.. 100  
     Pulse pressure... 37

**Case 68.—B.** Second examination.  
Nov. 20, 1914.

..... 92%  
 ..... 4,936,000  
 ..... 10,000  
     ..... 62%  
     ..... 8%  
     ..... 29%  
     ..... 1%

**Case 68.—C.** Third examination.  
Jan. 23, 1915.

Hemoglobin ..... 94%  
 Erythrocytes ..... 4,888,000  
 Leucocytes ..... 8,000  
     Polymorphonuclears ..... 60%  
     Large Mononuclears..... 9%  
     Small Mononuclears..... 30%  
     Eosinophiles ..... 1%

Periapical infections.... 3 ....moderate.

This patient was suffering from neurasthenia of two years' standing, which showed immediate improvement with eradication of the infected foci. He has practically regained his normal health at this time without other than the surgical treatment indicated.

**Case 64.—A.** Dr. Mc. Oct. 23,  
1914. Age 48.

Hemoglobin .....	70%
Erythrocytes .....	4,440,000
Leucocytes .....	10,400
Polymorphonuclears .....	72%
Large Mononuclears.....	1%
Small Mononuclears.....	25%
Eosinophiles .....	2%

Systolic ..... 130

BLOOD PRESSURE. Diastolic., 100

Pulse pressure... 30

**Case 64.—B.** Second examination.  
Oct. 29, 1914.

.....	88%
.....	4,704,000
.....	8,200
.....	63%
.....	7%
.....	30%
.....	0



Fig. 5.

**Case 64.—C.** Third examination.  
Nov. 4, 1914.

Hemoglobin .....	93%
Erythrocytes .....	4,732,000
Leucocytes .....	7,600
Polymorphonuclears .....	64%
Large Mononuclears.....	6%
Small Mononuclears.....	29%
Eosinophiles .....	1%

Periapical infection.... 2 ....moderate, one shown in Fig. 5.

A brief report of the history of Case 64 is here published, as a fair example of one of the usual findings in this group.

- History.— Presented with serous iritis. All causative factors with the exception of the pyorrhea about the four lower incisors had been excluded. The chronic infection about these teeth thought to be the definite cause of the iritis. Teeth extracted one week ago, patient feels there has been some improvement since the extraction of the teeth. Mouth had been examined and declared to be free from all chronic infection.
- Examination.— Film radiograph of all pulpless teeth were advised. Two bone abscesses were found—more important about upper left cuspid and lower right second bicuspid. Blood examination taken previous to the extraction of the teeth about which bone abscesses were found showed effects of chronic infection upon the system.
- Operation.— Teeth extracted and bone cavities curetted.
- Oct. 24, 1914.— Teeth to be extracted were dried and crowns painted with tincture of iodine and the area protected with sterile gauze. Teeth then carefully removed to prevent bacterial contamination—root ends amputated with sterile saw and placed in sterile bottles—sent to the Columbus Medical Laboratories for aerobic and anaerobic tests for the presence of bacteria.
- Nov. 3, 1915.— Vision reported normal by those in charge.  
Columbus Medical Laboratories' Report.  
Specimen of two teeth.
- Upper Tooth.— Ærobic:  
Streptococci—present (*Streptococcus pyogenes*).  
Staphylococci—present (*Staphylococcus pyogenes*  
Saprophytic bacilli—present. aureus).  
Anærobic:  
Pus cocci—present.  
Proteus bacillus—present.
- Lower (dry tooth).— Ærobic:  
Staphylococci—present (*Staphylococcus pyogenes*  
Saprophytic bacilli—present aureus).  
Anærobic:  
Very few cocci grew.

# Items of Interest

**Case 79.—A.** Mr. B. Jan. 2, 1915.  
Age 32.

Hemoglobin .....	93%
Erythrocytes .....	4,840,000
Leucocytes .....	9,600
Polymorphonuclears .....	70%
Large Mononuclears.....	5%
Small Mononuclears.....	25%
Eosinophiles .....	0
Systolic .....	124
BLOOD PRESSURE. Diastolic..	98
Pulse pressure...	26

**Case 79.—B.** Second examination.  
Jan. 29, 1915.

.....	100%
.....	5,304,000
.....	10,000
.....	70%
.....	4%
.....	23%
.....	3%



Fig. 6.

Periapical infections. . . . . slight as shown in Fig. 6.

Began root canal treatment on January 8th, but was unable to reach the apex with instruments until February 2nd.

**Case 79.—C.** Third examination.  
Feb. 12, 1915.

Hemoglobin .....	100%
Erythrocytes .....	5,016,000
Leucocytes .....	8,000
Polymorphonuclears .....	60%
Large Mononuclears.....	8%
Small Mononuclears.....	30%
Eosinophiles .....	2%

The above examination was made ten days after remedies had been applied to the root end—with five days intermission. Root canal filling placed March 15th, but the radiograph taken showed the apical third unfilled.

**Case 79.—D.** Fourth examination.  
Mar. 18, 1915.

.....	102%
.....	5,128,000
.....	8,800
.....	66%
.....	3%
.....	30%
.....	1%

The above examination taken three days after the root canal filling was placed shows the infective process again becoming active.

**Case 79.—E.** Fifth examination.  
Aug. 16, 1915.

Hemoglobin .....	100%
Erythrocytes .....	4,976,000
Leucocytes .....	10,400
Polymorphonuclears .....	72%
Large Mononuclears.....	2%
Small Mononuclears.....	24%
Eosinophiles .....	2%

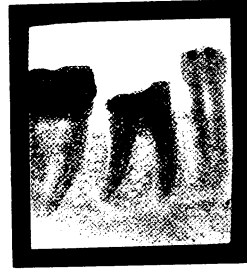


Fig. 7.

The root canal filling was removed on April 6th and a number of unsuccessful efforts made to enlarge the canals to the apex. A treatment was placed on May 25th and further attention discontinued. On August 16th the blood examination showed the re-establishment of the infective process, practically corresponding to the findings recorded January 2nd.

#### Group 6.

Cases of chronic periapical infection not having evacuating sinuses and the body thought to be free from all other focal infective processes, with fair to normal hemoglobin content and erythrocyte count and moderate leucopenia present, reporting two of the four belonging to this group.

#### Remanalisys.

**Case 123.—H.** Dr. P. Mar. 5, 1915.  
Age 44.

Hemoglobin .....	94%
Erythrocytes .....	4,712,000
Leucocytes .....	5,000
Polymorphonuclears .....	50%
Large Mononuclears.....	8%
Small Mononuclears.....	41%
Eosinophiles .....	1%

Systolic ..... 130  
BLOOD PRESSURE. Diastolic.. 90

Pulse pressure... 40  
Periapical infections...I..moderate

(See Fig. 8)

**Case 123.—B.** Second examination.  
Aug. 26, 1915.

.....	95%
.....	4,888,000
.....	7,200
.....	61%
.....	4%
.....	33%
.....	2%

Periapical infections...I..moderate

## Items of Interest

**Case 157.** Dr. H. May 24, 1915.  
Age 56.

Hemoglobin ..... 92%  
Erythrocytes ..... 4,840,000  
Leucocytes ..... 5,800  
    Polymorphonuclears ..... 58%  
    Large Mononuclears..... 3%  
    Small Mononuclears..... 37%  
    Eosinophiles ..... 2%

(Radiograph of this case shown  
in Fig. 9.)

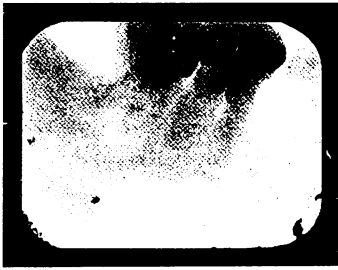


Fig. 8.

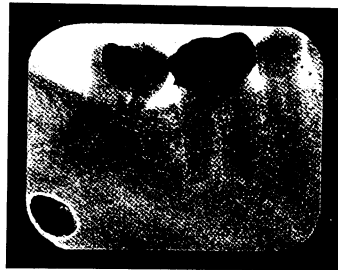


Fig. 9.

### Discussion of Groups, Cases and Conclusions.

In the examinations as here made, I found in 100 out of 162 cases that blood changes had occurred that were held to be the sequence of chronic oral infections associated with teeth.

**Anemia.** That neither pronounced nor moderate anemia was commonly associated with chronic oral infections in this series, as claimed by many authors; however pronounced anemia was found once as shown in Case No. 175, in group 4.

**Leucopenia.** That leucopenia was more constant than leucocytosis in pyorrhea cases where the blood findings were abnormal; furthermore, leucopenia was more frequent in those cases where the pyorrhea pockets did not involve the root ends and in the absence of periapical focal infection without discharging sinuses.

**Leucocytosis.** That leucocytosis when associated with pyorrhea cases was most frequent where the pyorrhea pockets extended nearly to or did involve the root ends.

That abnormal blood findings were present in forty-eight of the

one hundred and ten pyorrhea cases examined. Full urinalysis was made of all pyorrhea cases although not here reported.

That leucocytosis was present in forty-seven of the fifty-two cases of periapical infections without discharging sinuses—but that leucopenia does occur under the same conditions is presented in Group 6. Let the foregoing statement be not misconstrued to mean that either leucocytosis or leucopenia is always present when a chronic periapical infection without a discharging sinus is found, for periods arise when the effect of the infective biproducts is so slight that its result is not manifested in a blood change. But, since severe secondary infections could occur during this period, a focal infection although producing no characteristic blood change must always be looked upon as a menace to the health of the patient and its eradication demanded.

**Interesting Case  
Involving Defective  
Root Filling.**

I desire to call particular attention to two cases, Nos. 70 and 79, wherein secondary effects resulted from the periapical infection shown in the illustration accompanying the reports. In Case No. 79, a few days after the dentist had been able to carry

the remedy to or through the root end, the blood count changed to normal and the secondary involvement began to improve and continued to do so until a brief period after the root canals were filled; then upon complaint from the patient that the original secondary trouble had returned, another blood count was taken which showed a slight leucocytosis. A radiograph then taken proved that the root canals had not been more than two-thirds filled. The root canal filling was removed and treatment again undertaken. The dentist in charge decided he would be unable to perfectly fill the canals, and the patient was allowed to go with the remedy in the tooth for six weeks. The neuritis increased and the blood examination taken six weeks after the last treatment had been placed showed it to be practically the same as the original count. On August 21st, I removed the tooth and curetted the periapical area. The blood count taken three days after this was Hemoglobin 102, Erythrocytes 5,000,800, Leucocytes 8,400, Polys 63, Large 5, Small 32.

Case 70 was a patient thought to be suffering only from pyorrhea and the blood examination showed slight leucocytosis which did not materially change after treatment, nor did the first series of radiographs of the teeth show a definite rarefied area, but upon Ferradic test a pulpless bicuspid was found. This tooth was treated, root canal filled—the secondary involvement disappeared and the blood count returned to normal.

**Periapical  
Infections.**

This gives me the opportunity to focus the attention of those called upon to determine the presence of chronic focal infections associated with teeth, not to confine their examinations only to the supporting structures and radiographs taken of the roots to outline rarefied areas, for one may have a pulpless tooth present without a rarefied periapical area and at the same time have a chronic infective process in the remnants of pulp tissue, which I have found in three cases to be accountable for a serious secondary effect.

Nor can one with any degree of assurance eradicate periapical infections by the mere extraction of teeth unless it be accompanied by a curettement, for in two instances I have had patients go several months without any symptoms of the original secondary involvements and then have noted their reappearance without the development of any new focal infections, and upon making blood examinations I found the possible evidence of a chronic infection, although the tissue had healed with every appearance of being normal over the area where the tooth was removed. I then opened into the old infected tract, curetted it and in one instance the patient had a definite reaction similar to that experienced after injection of an autogenous vaccine during the original treatment. A second patient had a less marked reaction. Therefore it becomes necessary to do something more than to extract teeth or amputate roots and do an indifferent curettement to secure positive elimination of focal infections associated with teeth.

In closing this communication I wish to express my appreciation of Hunter's early studies upon the effects of oral sepsis and the valuable contributions of Billings and his associates upon the systemic effects of chronic focal infections.

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**Oral Sepsis as Related to Systemic Disease.**

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*Read before the Panama Pacific Dental Congress, Section II, Sept. 7, 1915,*

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The term "oral sepsis" and the recognition of this condition as a clinical entity is, I believe, to be accredited to William Hunter, of England, whose early recognition of the condition and its association with general debility and constant dyspepsia marks the beginning of the study of a subject which within the last decade has assumed gigantic proportions. Used by him to designate a condition related only to the teeth, it has since come into general use by the medical fraternity and includes as well, sepsis or infection originating in the tonsils or elsewhere in the

oral cavity. In our own country much of the pioneer work of educating the medical profession as well as the dental fraternity, and the laity to a recognition and understanding of the importance of this subject has emanated from Dr. M. H. Fletcher, of Cincinnati, Ohio. The subject to-day is occupying the medical profession to such an extent that hardly an issue of a medical journal appears, but one may find an article dealing with it at least indirectly, and yet I am sorry to say that the great majority of both professions are far from recognizing its importance.

I realize that what I shall have to say may be received with much honest doubt and perhaps considerable antagonism, but I trust that you will weigh the evidence thoroughly, and in the future study these cases conjointly with the physician with a view to determining for yourselves from personal experience whether or not one is justified in such conclusions as I shall draw.

**Systemic Infections  
of Local Origin.**

For many years it has been known that systemic disease of certain types result from infections which were originally and primarily localized to a certain definite circumscribed focus of infection. Thus I might call to your attention an infection such as we meet in a carbuncle. Here the focus is primarily localized, but before long it extends and I have no doubt that all of you have heard of cases in which the individual so afflicted has finally succumbed to general septicemia, or as it is commonly known, "blood-poisoning." You have also no doubt heard of such cases of blood-poisoning following a trivial accident such as a cut in the finger which became infected, or an infected abrasion of the skin.

We know medically that syphilis has a primary focus in the so-called chancre and that subsequently the infection becomes generalized and invades the entire body. Gonorrhea begins as a urethritis and may remain so—but on the other hand, it may become generalized and invade the joints of the body producing a gonorrhœal arthritis or "rheumatism," a gonorrhœal endocarditis, or even a septicæmia which may prove rapidly fatal. I wonder also, if it has not come to your ears at some time or other that so-and-so died of blood-poisoning following the extraction of an ulcerated tooth?

In other words it means that before a patient can be the victim of a generalized infection, the infective organism must have gained admission to his general system through some primary focus or port of entry. And it would not be unreasonable to suppose that teeth and the structures in which they are imbedded may sometimes be held responsible as being the site of the primary focus. That such is really the case and not merely a generalization based on possibility we have now ample proof to demonstrate.

**Rosenow's  
Experiments  
and Findings.**

E. C. Rosenow of Chicago, has for some years been conducting a series of experiments which can leave no room for doubt as to the culpability of teeth and tonsils (oral sepsis) in the production of such systemic diseases as articular and muscular rheumatism, endocarditis, streptococcaemia and other allied conditions, and in order to more fully understand the subject, I shall briefly review his work and conclusions.

Starting with a certain form of streptococci, Rosenow was able, by varying the cultural conditions under which he grew these organisms, to transform the original type into other types of streptococci which we have been accustomed to look upon as distinctly different from one another, in their biologic, serologic, and clinical characteristics. Not only was he able to produce different forms of streptococci but he further changed streptococci into the diplococci of pneumonia and vice versa. The essential cultural factor which he employed in bringing about these changes was a variation in the degree of oxygen tension.

Variations in the degree of oxygen tension are more or less difficult to obtain by laboratory methods. On the other hand in nature we could ask for nothing better than the oral cavity when it becomes diseased. Thus tonsils when infected become edematous and congested in some areas; scarred, fibrous and contracted with little blood in others, so that they are well supplied with oxygen through the blood stream in some portions and very poorly supplied in others. The crypts themselves upon their surface and in their depths offer the same variability in degree of oxygen.

In pyorrhœa there is beside the endamebic disease demonstrated by Bass an associated infection with pus forming organisms, mostly streptococcic in type, which are commonly present in all mouths. This infection begins around the gingival margin and is probably not very dangerous as regards systemic diseases as long as it remains on the surface. The process extends, however, to the deeper structures, and Bass has demonstrated that the endamebæ themselves actually pick up and carry micro-organisms into the deeper structures.

Here the only oxygen obtainable is that in the tissues brought there by the blood stream. If the tissue be infected, it is soon inflamed and edematous; it resists further invasion very feebly, and the bacteria multiply. Edema interferes with circulation and interference with circulation increases edema, and what was once an ærobic culture of an organism now goes through various modifications in its cultural environment and the organism assumes different pathogenic properties. They gain entrance into the blood stream and finally, depending upon their particular

affinity for certain structures find lodgment in a small capillary loop and systemic disease has its beginning.

What may this systemic disease be? Rosenow's early work was confined to endocarditis or infection of the heart valves, and articular and muscular rheumatism. He found that cultures from tonsils or infected teeth, blind abscesses, etc., from an individual suffering from these diseases when injected into animals would produce similar lesions. He isolated from joints and muscles organisms which when injected into animals produced again the same disease. From pus derived from tonsils he found a mixture of types of organisms which produced mixed rheumatic and endocarditic changes. He showed further that these diseases were embolic in origin, that is, that a clump of organisms became lodged in a capillary loop, which was too small to admit of its passage and located in a tissue for which the given organism possessed a particular affinity. If this was in a heart valve, an endocarditis resulted; if in the terdinous end of a muscle, a muscular rheumatism developed; if in the synovial membrane of a joint, an articular rheumatism was the sequel. As might well have been supposed the list of infectious embolic disturbances has since grown and depending upon the lodgment of the bacterial embolus, we may have the pneumonias, nephritis, cholecystitis, appendicitis, etc.

**Findings  
of Other  
Investigators.**

R. T. Woodyatt has called attention to the frequency with which exophthalmic goitre is associated with infected mouths, and Rosenow has in a number of such cases isolated a streptococcus from the thyroid gland which, when injected into animals, causes a hyperthyroidism to develop. Woodyatt has also collected a number of cases of glycosuria in which infections of the mouth were present and the glycosurias disappeared after the infected teeth or tonsils were removed. Wm. B. Wherry of Cincinnati, has studied a number of cases of infected mouths and has found that there are apparently periodic discharges of organisms into the blood-stream without any systemic disease.

This latter phenomenon of the periodic sowing of organisms into the general circulation probably explains the cause back of a case of paroxysmal, transient glycosuria observed by the author, which was independent of diet and disappeared entirely after the removal of a tooth which had an abscess at the root-tip revealed by the X-ray but otherwise undemonstrable by a very competent dentist.

Martin Fischer adds to the list, arterio-sclerosis which is to be looked upon as an embolic process in the minute blood vessels which supply the coats of the larger arteries of the body. It may likewise be-



come lodged in the capillaries of the kidney and produce nephritis, and as you have been told before, during this Congress, a so-called arthritis deformans may result from invasion of both the joints proper and the tissues about the joint.

The foregoing systemic diseases may, then, result from oral sepsis and other localized infections throughout the body. For the present let us confine ourselves to such conditions when they have as their primary focus, infection about the teeth including such things as pyorrhœa and blind abscess, and consider for a moment the causative factors of such infections.

The subject of pyorrhœa has received much attention lately and what I might say about the rôle of the endamoeba of Bass would be repetition of a thing which I have no doubt has been thoroughly thrashed out during this Congress. Furthermore it has no direct bearing upon the subject under discussion other than that the endamoebæ, as before mentioned, may and do carry microbic organisms into the deeper tissues and thus change the cultural conditions, which in turn alters the pathogenicity of the streptococcic group as proved by Rosenow.

**Etiology  
of Root  
Abscesses.**

Let us consider on the other hand the etiology of root abscesses. Here I would have you consider earnestly the causative factors spoken of by Martin H. Fischer. He calls attention to the fact primarily that teeth are living structures. All of us know that living tissue of any kind is infinitely more resistant to infection than dead tissue. Hence any procedure which would tend to interfere with the vitality of the tooth or its surrounding structures must of necessity lower resistance to infection and predispose to local disease. Under this heading we must place the use of arsenic and strong antiseptics such as phenol tricoresol, etc. These substances destroy bacteria no doubt, but they destroy living tissue as well.

Then comes the process known as devitalizing a tooth. The popular conception is that this process removes the nerve from the pulp canal, but as Fischer has pointed out, it also removes the nutrient artery from the center of a tooth, which naturally results in the death of the tooth centrally, again producing a favorable ground for the growth of bacteria. With the central canal deprived of its blood supply the pericementum alone is left to nourish the tooth, a thing which at best could be but very imperfectly done, but with an existing pyorrhœa or the further dental operation of placing a crown which necessitates the grinding away of the convex sides of projecting portions of the teeth, thus destroying many living cells again, it becomes an impossibility. Further the snugly fitting crown causes a pressure necrosis of the underlying cells. Infection in-

variably occurs around such crowns and the primary focus of possible subsequent systemic disease is planted.

The foregoing is not intended in anyway to reflect upon the technique of the dentist, the sterilization of hands and instruments, etc., for I am firmly convinced that this precaution is becoming general among them. Likewise devitalizing may be necessary for certain dental procedures now in use, but I trust the inexhaustible ingenuity of the dental profession will soon find a way to do without this method of treatment and indeed, it is well known that dentists abhor the full gold crown as much as the physicians, but find themselves compelled to use it in order to "save a tooth."

**Should All  
Teeth be  
Saved?**

This brings me to the important point in the discussion of the topic at hand. Is it wise always to attempt to "save the tooth"? About a year ago I observed a case of malignant endocarditis resulting in the death of a woman who had a number of loose teeth that were continually bathed in pus and which I considered to be the origin of her systemic disease. After her death her husband came to me and I found a badly infected loose cuspid with two sinuses discharging through the gum above. An X-ray showed a root abscess about the size of a pea and I advised him to have it removed at once. He was called hurriedly to Denver whence I received a letter from him in which he said: "You will be glad to hear that I have found a very clever dentist here, who promises me that he can save my tooth." He did save the tooth and likewise the infection. The man has since had an articular rheumatism and found a dentist who was clever enough to extract the offending member.

I believe that I realize as well as the members of your profession the necessity of saving teeth, but I feel that there is a time when it is a crime to attempt to save teeth. And it is for the recognition of this that I beg your co-operation. The mouth is only a part of the body and yet it has been pitifully neglected by the average physician in the past. On the other hand because the primary infectious focus begins around the teeth is no good reason for the dentist to say "this tooth should not be removed; it can be saved." I have often had patients return to me with the remark that their dentists absolutely refuse to extract a given tooth announcing that it "has nothing to do with your rheumatism, etc." To such dentists I would respectfully suggest that they know nothing about it. On the other hand I am perfectly willing to admit that the medical profession know practically nothing about dentistry. To them a root abscess is in a class with an infected Fallopian tube, a mastoid full of pus or a tonsil that is septic, and the infection must be treated surgically.

## Items of Interest

Of course, the whole thing resolves itself ultimately into a matter of prophylaxis. Teeth must not be allowed to get into the deplorable state in which we both so often find them. This requires education and I congratulate your profession on the magnificent work it has done in this connection by the wholesale examination of school children and the establishment of free clinics in the schools and congested districts. I envy you the power you exercise over most of your patients to make them return to you at certain intervals for examination. I have tried to do this with every patient I have seen in the last three years and I have two who realize the honesty of my purpose.

In conclusion let me ask that the two professions co-operate to the fullest to determine the result of radical removal of badly infected teeth on the one hand as contrasted with the conservative treatment of such cases on the other hand. Let us try to determine when you may save us from losing a tooth and when losing a tooth may save us perhaps from a fatal disease.

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## Operative Procedures in Relation to Dental Caries and Diseases of the Investing Tissues.

By ARTHUR D. BLACK, A.M., M.D., D.D.S., Chicago.

*Read before the Panama-Pacific Dental Congress, San Francisco, Cal., Section VIII, September 2, 1915.*

A review of the literature of the procedures in operative dentistry for the past sixty odd years reveals a peculiar lack of relationship between the pathology of dental caries and the diseases of the investing tissues of the teeth and the means employed in treatment. The lack of consideration for the investing tissues, because of failure of appreciation of their functions when in good health, and insufficient knowledge of the pathological changes when diseased, is one of the striking characteristics of dental practice.

It is not the intention of the author that this paper shall review in detail the progress which has been made in co-ordinating pathology and treatment, but attention will be called to certain things which have been more or less epoch making in our advancement.

Previous to 1890 little mention of the pathology of caries will be found in the literature of operative dentistry. The principal thought in the minds of most dentists previous to that time seems to have been to cut a cavity of such form that a "plug" might be placed securely. Even Dr. Miller, to whom all honor is due for the discovery of the micro-organisms which cause caries, had practically nothing to say of the pathology in relation to operative treatment. This was probably due to the fact that for a number of years he and others of our best men thought to treat caries by destroying or inhibiting the growth of the organisms, just as Koch expected to cure tuberculosis by destroying the tubercle bacilli. These studies apparently led Miller away for the time at least, from the more careful study of other details in the pathological process which later formed the basis of proper operative treatment.

### Filling Between Teeth.

Among the few early efforts at treatment of dental caries, that of Robt. Arthur, in filing away the proximal surfaces of the teeth to treat or prevent proximal decays, should be mentioned. Here was a plan—an effort to treat the disease—based upon the observation that proximal decays generally occur a little to the gingival of the contact point. It was reasoned that if the enamel of that portion of the teeth were cut away, such decays would be prevented, and the view was correct. But it did not require many years to learn that the destruction of the interproximal soft tissue was much more serious than the proximal decays,



because this treatment permitted the impaction of food between the teeth so filed, and this resulted, not only in new decays in the region of the gingival line, which were much more difficult to treat than the ordinary proximal decays, but also in serious disease of the periodontal membrane.

The practice of extracting four bicuspids to give the teeth room to separate a little, was another similar effort.

Closely akin to the above was the plan of using "separating" files to cut away portions of proximal surfaces as a part of their preparation to receive fillings. Before the use of cohesive gold became general, this was necessary for both access and retention, and as the contour could not be restored with non-cohesive gold, the spaces were necessarily left wide open, resulting in the mutilation and eventual destruction of the septal tissues.

It seems to require disaster and calamity to make us see things which we should have seen before. It required an Iroquois Theatre fire to make our theatres all over the country reasonably safe; the disaster of the *Titanic* was necessary to secure ample facilities in the matter of life boats, etc.; the more recent *Eastland* horror in Chicago will doubtless bring about more careful inspection and better construction of our lake and other pleasure boats. In the same way, many of the dental procedures of the early days, which resulted in such dreadful destruction of the investing tissues and the eventual loss of many teeth, with no one knows how great a toll of life from more serious conditions resulting secondarily, have opened our eyes to better methods of operating.

It was the combination of the discovery of the cohesive property of gold foil—also by Dr. Arthur—and of the rubber dam by Dr. Barnum, together with the recognition by a few of the damage resulting from the open contact, which lead to the effort to restore contacts by filling operations. Here was the beginning treatment by operative procedure for the prevention of disease of the investing tissues.

**Extension  
for Prevention.** Then came the proposition of "extension for prevention" as applied to cavity preparation in the treatment of dental caries. While this subject has been discussed as much as any in our literature dur-

ing the past twenty years, and therefore needs little mention here, I would like to impress the fact that it was based on a very careful study of the pathology of caries, and I believe it will go down in history as the first serious scientific effort to place the treatment of dental caries in proper relationship to the disease. This study included nothing of theory; only facts which have become quite clear to those who have been sufficiently interested to observe them. These studies dealt entirely with surface involvement of the enamel and consisted of: 1. A tabulation of many thou-

sand small (beginning) decays, which established the fact that practically all decays begin in certain positions which naturally group themselves into pit and fissure, proximal and gingival third decays. 2. The observation of the extent to which these decays might eventually spread on the surface of the enamel, which made it possible to establish reasonably definite lines of immunity. These have since been our guide in the preparation of outline forms of cavities.

**Restoration of  
Contact to  
Protect Gingivæ.**

These studies of the progress of caries brought out prominently the importance of the healthy gingivæ as a factor in limiting surface extensions, and the necessity of so executing the filling operations that the best health of the gingivæ would be conserved. This involved the study of normal contours and contacts in relation to diseases of both the hard and the soft tissues, and served to establish the fact that with every operation involving a proximal surface or a gingival third position, the future health of both the hard and soft tissues must be given due consideration. It seems that the profession does not yet sufficiently appreciate the relationship of the filling operation to the future health of the soft tissues.

**Relation of  
Teeth to the  
Healthy Mouth.**

The most conservative treatment should be based on the fullest possible knowledge of the histological structure and physical functions of the tissues with which we are dealing; also of the pathological processes to which they are subject. Just as it is necessary to know the minute structure of the tooth in order to understand the beginnings and progress of caries, so is it essential that the structure, including particularly that of the specialized elements, of the gingivæ and peridental membrane be well known. We must also come to recognize more clearly than we have heretofore the picture of the healthy mouth, in order that we may be better able to detect the slight deviations from normal which will enable us to apply treatment for the protection and conservation of these tissues earlier than has been commonly done.

The problem of dentistry to-day is that of the clean mouth. The clean mouth is the healthy mouth. Natural forces are of much greater importance in maintaining mouth cleanliness than artificial cleaning. The mouth which will require the least of artificial cleaning, by either dentist or patient, is the one in which all of the teeth are present in normal occlusion, with the investing tissues everywhere entwined about the teeth, with gingivæ thinning away to almost knife edge crests on all buccal labial and lingual surfaces of the teeth—conditions which promote natural cleanliness by facilitating movements of foods over tooth surfaces and gingival margins to positions where they are controlled by the various muscular



tissues until finally ready to be swallowed, leaving the least possible residue in the mouth.

We should recognize the conditions necessary and the forces which operate to maintain the healthy mouth, also the injuries which result from any interference or interruption of these. Many have doubtless seen skulls of squirrels and other rodents which had suffered a fracture of a lower incisor tooth, with the result that the corresponding upper tooth was not kept of normal length by wear, and by its continued growth caused the death of the animal from starvation. In such cases the balance of action between forces, which normally operate to maintain health, is lost with disastrous results. So in the human mouth we often see injury and disease as a result of the lack of balance between normally opposed forces, as in the movements of teeth after the extraction of one or more. Practically every such occurrence diminishes the natural cleaning by vigorous mastication, and thus contributes toward disease. If the periodontal membrane is seriously injured along one side of the root of a tooth, the balance of pull of the various fibres of the periodontal membrane is lost and the tooth is moved out of position—away from the injured side. If the original injury is to the interproximal tissue, due to lack of contact of the teeth, or to an abnormal contact, the inflammation will usually result in the movement of adjacent teeth and the gradual involvement and destruction of their investing tissues as well.

**Gingivitis  
Due to Faulty  
Dental Operations.**

Carefully compiled statistics show that in the mouths of young adults—between the ages of twenty and thirty-five—there are, on the average, about eight areas of gingivitis per mouth, and that more than half of all such inflammations are due to dental operations, in the performance of which the dentist has failed to restore proper contours or contacts. These inflammations are the beginnings of disease involving the periodontal membrane, and a full understanding of the pathology of both will result in greater care in each operation performed.

We must presume that dentists have generally failed to recognize or appreciate the connection between the imperfect operation and the pathological condition which has resulted, because if the relationship were appreciated, we can hardly believe that so large a number of cases would continue to present in which the imperfect dental operation is the direct cause of the disease of the periodontal membrane.

**Natural Cleansing  
Better than  
Artificial Cleansing.**

Many members of the profession seem to be over zealous in their efforts at artificial cleanliness without exhibiting in their operative procedures sufficient appreciation of the highest efficiency of natural cleanliness by the maintenance of the best possible contours



and contacts. It is far better to so perform our operations that there will be the most effective natural cleaning by mastication, requiring so little of artificial cleaning that this may be done for the most part by the patient, than to establish as a result of imperfect operations conditions which make natural cleaning impossible and much artificial cleaning imperative.

The principal thought in the preparation of this paper has been to emphasize once again the fact that not only recurrences of decay, but also a very large percentage of cases of disease of the peridental membrane are preventable by the institution of more careful technic in operative procedures; that our treatment of the mouth, by filling operations and otherwise, should be undertaken and carried out quite as much on the basis of the condition of the soft tissues as of the hard. To do this as a regular routine procedure, we should make a definite record of each area of inflammation of the investing tissues as a part of a very critical examination of each mouth. We should have fixed in our minds the picture of the clean, healthy mouth in order that we may be able to recognize the slight deviations from health in the soft tissues, and that we should study out the cause of each area of inflammation and each decay. We will then be able, by the prompt correction of such causes—in most cases by the employment of properly planned and skillfully executed operative procedures, to maintain a larger percentage of mouths in good health to old age.

The technic of such methods is not to be presented here. The technic will vary much for different cases, but will consist for the most part in the maintenance of proper contours and contacts.





### **Mouth Infection and Systemic Disease.**

In this issue appear four papers to which we would call special attention, and it is our belief that any one would profit by reading them consecutively and at a single sitting.

The first by Dr. G. F. Logan, of Philadelphia, is welcomed as peculiarly timely. The communication is unique in its method of attacking a dental problem. Within the knowledge or memory of the present writer no other man has ever before dissected a dental theory entirely, or at least mainly by the rules of logic. And it is for this reason that we are glad just now to receive and give prominence to such a disquisition. The rank and file of our profession are all too prone to follow leaders; to accept as final the dicta of its best known men; of its habitual writers. The rank and file, busily occupied in the humdrum work of "supporting their families and educating their children" are unable themselves to test out the utterances of our research workers, by carrying on experiments, either similar to, or dissimilar from those through which these men's conclusions have been reached. Yet it is by the work of the rank and file, the great middle class of dentists so to speak, that dentistry and dentists are finally judged by the communities among whom they live and for whom they are presumed to render the best service.

The layman rarely knows anything about the pronouncements of our scientists, except when some unusual theory is given prominent place

in the lay press, and then usually the information is mixed with much misinformation; hopes are engendered, and if not fulfilled the dentist falls back to even a lower place in public esteem than that which he had enjoyed priorly.

It therefore follows as a logical sequence that the duty of the professional man requires, that if he be a research worker he should make no announcements of discoveries, until prepared to have his deductions tested by the strictest rules of logic; and if he be merely the man addressed he should test out the communication in regard to an alleged discovery by strictly logical rules, before acquiescing in the deductions.

Just at the present time the medical and dental world are passing through a critical period. Medical and dental research workers are repeatedly asserting that causal relations exist between oral foci of infection and systemic lesions.

It may be safely stated that already enough evidence has been brought forward to sustain the general postulate that "a distant systemic lesion may be the offspring of a local oral focus of infection." But let it be constantly borne in mind that *evidence*, even a great mass of evidence, all indicating the existence of a certain condition, is not necessarily *proof* that the indicated condition does actually exist. Any one will admit this, if he would but attend any trial of an important issue; if the jury were asked to render a verdict after hearing the prosecution's case only, they probably would convict the accused. After hearing the counter evidence they frequently acquit him.

Therefore it would be well if all our readers would read Dr. G. F. Logan's paper, not once but several times, that their minds may be induced from now on to apply the test of logic to the communications of the past, present, and the future in regard to oral infections and their relations with systemic disease.

**The Test  
of Logic.**

Dr. Logan tells us that, "It may enable the reader to follow the argument better if he will keep in mind the absolute necessity of a cause being invariable in its action; that causes are mere links in changes; the change that immediately precedes another change is the cause of the second change, and the second change immediately becomes the cause of the third change."



Later on he gives us a working syllogism, symbolized thus: "P is M." "S is P." Therefore "S is M." Applying this to the problematic relation of tartar as a cause of pyorrhea he thus expresses it; "Pyorrhea is always caused by tartar. Mrs. Jones's teeth are coated with tartar. Therefore Mrs. Jones's teeth are pyorrheal."

But the present writer has no wish to follow Dr. Logan on his excursion into the discussion of this problem along the route of logic, but rather to lead the reader's mind into a possibly similar consideration of the greatest of all dental problems "the true relation of mouth infection to systemic disease."

We are told now by a great many of our best thinkers that a blind abscess at the end of a tooth root may induce arthritis, endocarditis and even death. A few have not even been careful enough in their announcements to interpolate the word "*may*." But we shall now see that this word short as it is, is of extreme importance. For example we might erect a syllogism of this sort.

"Arthritis is caused by streptococcus viridans. Streptococcus viridans is commonly found in blind abscesses. Therefore blind abscesses cause arthritis." Or thus; "Arthritis is found associated with blind abscesses. The abscessed teeth are extracted and the disease disappears. Therefore the blind abscesses caused the disease." These, and several similar syllogisms indeed are about the sum and substance of the evidence thus far offered. Syllogisms like the above, tested under the rules expounded by Dr. Logan would not stand, because his final conclusion in regard to a similar syllogism in relation to tartar as a cause of pyorrhea reads thus: "If then we concede that pyorrhea is ever possible without the presence of tartar, then \* \* \* \* \* tartar is never the cause or even an element in the cause of pyorrhea."

Similarly one might say; "If arthritis ever exists in the absence of a non-fistulous abscess on a tooth root, then we cannot declare that arthritis is caused by a non-fistulous root abscess."

But this is not sound logic, though an argument having some weight. The syllogisms used, though accurately expressing many of the claims that have thus far been made and used as a basis for the argument that tooth abscesses have been the direct causal factors in arthritis, endocarditis and other lesions, are not fair statements of the true conditions. The following syllogism is perhaps better.

"Arthritis is of bacterial origin and bacteria enter the system through a local port. The mouth is a local port, and the apices of teeth are often the propagating foci of bacterial infection. Therefore an arthritis may be a sequential result of an abscess at the end of a root."

The word "*may*" it is seen here assumes great importance. Dr. Logan interjected the word "*always*" (tartar is always the cause of pyorrhea) and the postulate falls under logical rule. But if we say "*may*" the postulate of systemic infection from root abscesses, not only does not fail, but on the contrary we are forced to further research and further argument before we arrive at the truth. Thus, the last syllogism declares that in arthritis (and this is even more clearly seen in endocarditis) "the bacteria enter the system through a local port." Let us then say, "the mouth is a local port, therefore the bacteria may enter through the mouth." But this is only the first link in the chain. The second link compels us to find a local sore or focus of infection within or adjacent to the mouth. We have besides tooth roots, likewise the crypts of the tonsils, and it is noteworthy that the tonsils were accused of being causal factors in rheumatisms long before the roots of teeth were even suspected. Suppose then that both tonsils and teeth are found infected coincidentally with the existence of an arthritis, which shall we blame?

*The writer is not denying that non fistulous abscesses may cause arthritis, endocarditis and other important systemic lesions. He thinks they may, but he is pleading for more logical proof, so that in future we may definitely determine when the systemic disturbance originates in the mouth, and when it does not.*

With this plea in mind we heartily recommend a perusal and study of the paper read at the recent Congress by W. H. Strietmann, M.D. That the theory of systematic infection through a local port of entry is not new is claimed by Dr. Strietmann where he says:

**Dr. Strietmann's  
Congress Paper.**

**Systemic Infections  
of Local Origin.**

"For many years it has been known that systemic diseases of certain types resulted from infections which were originally and primarily localized to a certain definite circumscribed focus of infection. Thus I might call to your attention an infection such as we meet in a carbuncle. Here the focus is primarily localized, but before long it extends



## Items of Interest

and I have no doubt that all of you have heard of cases in which the individual so afflicted finally succumbed to general septicemia, or as it is commonly known, a "blood-poisoning." You have also no doubt heard of such cases of blood-poisoning following a trivial accident such as a cut in the finger which became infected, or an infected abrasion of the skin.

"We know medically that syphilis has a primary focus in the so-called chancre and that subsequently the infection becomes generalized and invades the entire body. Gonorrhoea begins as a urethritis and may remain so—but on the other hand, it may become generalized and invade the joints of the body producing a gonorrhoeal arthritis or "rheumatism," gonorrhoeal endocarditis, or even a septicæmia which may prove rapidly fatal. I wonder also, if it has not come to your ears at some time or other that so-and-so died of blood-poisoning following the extraction of an abraded tooth?

"In other words it means that before a patient can be the victim of a generalized infection, the infective organism must have gained admission to his general system through some primary focus or port of entry. And it would not be unreasonable to suppose that teeth and the structures in which they are imbedded may sometimes be held responsible—as being the site of the primary focus. That such is really the case and not merely a generalization based on possibility we have now ample proof to demonstrate."

It is noteworthy that Dr. Strietmann here says that "\*\*\*\*\*the teeth and the structures in which they are imbedded *may* sometimes be held responsible." Whether or not his next statement that, "We now have abundant proof to demonstrate this" be true, is left to the determination of each reader after studying his communication.

The paper read before the Congress by Dr.  
**Dr. H. G. Logan's** H. G. Logan of Chicago, presents valuable statistics  
**Congress Paper.** along lines somewhat different to what has been

presented by other investigators, and consequently adds considerable weight to the plausibility of the theory that there is causal relationship between mouth infections and systemic disturbances. Dr Logan tested his cases by making blood examinations before and after treatment, in 162 consecutive cases. The fact that these were consecutive and not selected cases, and that they occurred in private practice and not in a hospital adds much to the value of the information presented by Dr. Logan. Classifying his cases into six different types, he found



fairly constant conditions, and equally constant the effects of treatment. The clearing up of the local source of infection was commonly followed by an improvement in the blood picture. This certainly is significant. Dr. Logan calls special attention to two cases, Nos. 70 and 79 and these certainly are extremely interesting. His most important conclusion however is as follows:

"Nor can one with any degree of assurance eradicate periapical infections by the mere extraction of teeth unless it be accompanied by a curettement, for in two instances I have had patients go several months without any symptoms of the original secondary involvements and then have noted their reappearance without the development of any new focal infections, and upon making blood examinations I found the possible evidence of a chronic infection, although the tissue had healed with every appearance of being normal over the area where the tooth was removed. I then opened into the old infected tract, curetted it and in one instance the patient had a definite reaction similar to that experienced after injection of an autogenous vaccine during the original treatment. A second patient had a less marked reaction. Therefore it becomes necessary to do something more than to extract teeth or amputate roots and do an indifferent curettement to secure positive elimination of focal infections associated with teeth."

Here we see that the blood picture was a reliable indication that a case was not cured, even though the clinical and outward appearance of the tissues would have induced one to believe that a cure had been effected.

**Responsibility  
of Dentists for  
Infections.**

Thus far the dental profession have only been asked to answer the accusation that they have contributed to mouth infections through imperfect root canal treatment and filling. Their reply has been that root canal treatment and filling is so difficult that only the most skilled may hope to master the technic; that some roots present obstacles which render perfect work impossible; and finally, that patients will not pay for it anyway.

Now another indictment is made that certainly should startle the dental profession from its self-satisfied assurance that aside from root canal treatment their work is all that it should be.

In a paper read recently before the Second District Dental Society of New York, Dr. W. T. Barrett, speaking of the treatment of



## Items of Interest

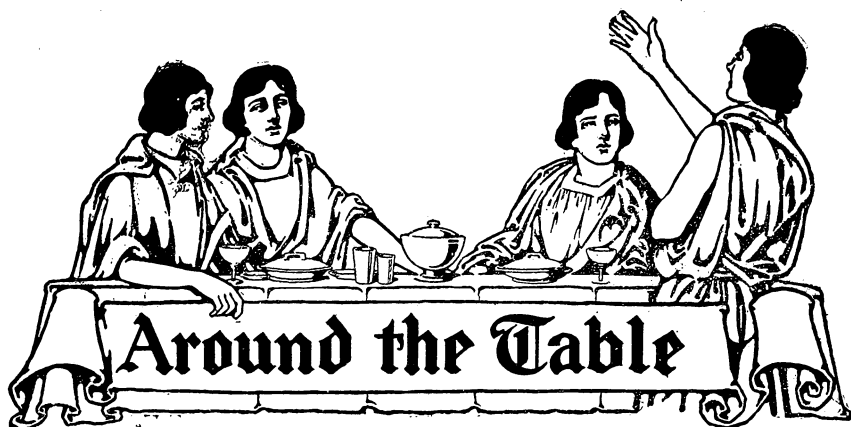
pyorrhea with emetin, declared that at the outset, in selecting test cases for treatment he had excluded certain suppurating cases as being not pyorrhea, even though pockets existed. Asked in the discussion to be more specific, he declared that suppurating conditions, accompanied by vertical destruction of the alveolar bone, thus instituting pockets discharging pus are often found when the cause has been faulty construction of fillings, crowns and bridges.

In this connection the paper read before the Congress by Dr. Arthur D. Black of Chicago, is most significant. The paper should be read in full, especially by those who may now honestly believe that their operative procedures cannot precipitate mouth infections. The following quotation summarizes Dr. Black's most important statement:

**Gingivitis  
Due to Faulty  
Dental Operations.**

"Carefully compiled statistics show that in the mouths of young adults—between the ages of twenty and thirty-five—there are, on the average, about eight areas of gingivitis per mouth, and that more than half of all such inflammations are due to dental operations, in the performance of which the dentist has failed to restore proper contours or contacts. These inflammations are the beginnings of disease involving the peridental membrane, and a full understanding of the pathology of both will result in greater care in each operation performed.

"We must presume that dentists have generally failed to recognize or appreciate the connection between the imperfect operation and the pathological condition which has resulted, because if the relationship were appreciated, we can hardly believe that so large a number of cases would continue to present in which the imperfect dental operation is the direct cause of the disease of the peridental membrane."



THERE ARE A FEW communications from those interested in this department which we must consider this month, one of which is from Dr. E. F. Izin, who is apparently eager to break a lance in defense of Dr. Howe, and against the Boston Doctors who declare that children may eat candy. Dr. Izin writes as follows:

■ ■ ■

"TO STATE THAT SUGAR in the form of candy is necessary for the sustenance of the growing child is almost the most preposterous statement of modern times. Dr. Roessler a few years ago disposed of this matter in a very able article on the subject of sugar and candy. I maintain and refuse to recede from the position that natural fruits and vegetables furnish all the saccharin required by anyone. Who ever heard of an individual being deficient in sugar? The candy habit of to-day is one of the most harmful practices of the twentieth century. I have little doubt that Dr. Howe voices my own views, though I have not had the pleasure of reading his paper."

■ ■ ■

NOW THEN, FRIENDS, if you must buy some candy, get ten cents' worth and eat it yourself. But do not give any to the kiddies!

■ ■ ■

THE FOLLOWING reads like a very practical suggestion, made by Dr. R. L. Graber, of Peoria, Illinois. This is a method of replacing a facing broken from a crown or fixed bridge:

■ ■ ■

"SELECT A FACING of proper size and color. From very thin copper make a backing to fit the facing. This is merely to be used as a pattern, and we shall call it pattern number one. Next make a similar pattern of the space where the facing is to be replaced. Call this pattern number two. Place pattern number one over pattern number two and punch pin holes in number two, as indicated by number one. Place pattern number two (which now has pin holes in proper position), in space where facing has been lost, and using it as a guide drill pin holes through the backing left on tooth, or bridge, as the case may be. Now place pattern number two on new facing and grind facing to conform with the pattern. Set facing in place and grind pins flush with the lingual surface of crown



- ❖ or bridge. Remove facing, thread the pins, and then with a large round
- ❖ bur countersink the holes on the lingual side. Set facing with cement
- ❖ and fill around pins with amalgam, and smile while you do it. The
- ❖ entire operation should be done in twenty minutes, and done well."

❑ ❑ ❑

NOW THAT WE ARE all insisting upon restoring occlusal form when filling

- ❖ teeth, either with gold inlays or with amalgam, the following very in-
- ❖ genious method, suggested by Dr. J. F. Mayer, of Philadelphia, will be
- ❖ found interesting. He writes as follows:

❑ ❑ ❑

"THIS METHOD IS APPLICABLE only to teeth in which the entire masti-

- ❖ cating surface is to be restored. I use the die forms intended for striking
- ❖ up occlusal cusps for gold shell crowns, and I strike up a large variety
- ❖ of cusps, using 36 gauge copper. The cavity of the tooth having been
- ❖ prepared, I select a copper cusp of approximately correct size and form
- ❖ and place it upon the tooth to be filled, burnishing the margins of the
- ❖ copper cusps, close against the natural tooth, so that it may not be dis-
- ❖ lodged when the patient bites upon it. I then have the patient bring the
- ❖ jaws together and bite upon the copper cusp, which is soft enough to
- ❖ yield under this stress, and thus is produced an accurate occlusion. The
- ❖ copper cusp is then inverted and thin tin foil burnished against the inner
- ❖ side, after which it is filled flush with amalgam. It is preferable to use
- ❖ one of the quick-setting types of amalgam, which is soft for a minute
- ❖ or two. The cavity is then quickly filled with same material and the
- ❖ copper cusp placed in position on the tooth so that the two amalgams
- ❖ come together and unite under pressure, which is best insured by having
- ❖ the patient close the jaws again. The mouth should be kept shut until
- ❖ the amalgam has begun to set, when the copper cusp can be lifted off
- ❖ and any excess removed. The result will give good reproduction of
- ❖ natural teeth and the occlusion will be accurate."

❑ ❑ ❑

IT WOULD SEEM that better results might be obtained by using natural

- ❖ teeth as dies with which to stamp up the copper cusp matrices. The
- ❖ teeth could be imbedded in plaster so that only the morsal third would
- ❖ be exposed, and a low fusing metal counter could be made by using a
- ❖ ring and pouring the metal over them. The cusp matrices could then
- ❖ be swaged into these counter dies by any of the usual methods. It must
- ❖ be said, however, that the specimen filled tooth sent in by Dr. Mayer
- ❖ is very pretty, and proves that the method can be made useful.

❑ ❑ ❑

SPEAKING OF THE TIME lost in using the indirect method of making

- ❖ cast gold inlays, Dr. H. Mason Perkins, of Boston, writes as follows:
- ❖ "For some time I have been making my inlays by the indirect method,
- ❖ and have always used Ames's copper amalgam. Of course, it requires
- ❖ four or five hours for the amalgam to become hard enough for use.
- ❖ For the past three months I have been using a quick-setting cement made
- ❖ by Klewe & Co. I pack the impression with this, being very careful
- ❖ in the packing, and in twenty minutes it is ready to be separated from
- ❖ my impression. Needless to say, the impression should be a good one
- ❖ with well-defined margins."



DR. E. MELVILLE QUINBY, likewise of Boston, writes as follows: "I have  
❖ the temerity to apply for a modest seat at or in the vicinity of the  
❖ Table. I am particularly interested in plate work, possibly from the  
❖ fact that I have spent most of my life in an English atmosphere of den-  
❖ tistry. The almost universal method with us with regard to partial upper  
❖ dentures is as follows: Obtain a good impression of course, usually  
❖ with impression compound. Then cast a high model as for a gold plate.  
❖ Obtain zinc die and lead counter. Next take gold plate, 16 karats, gauge  
❖ 20, about. Strike up a small plate, keeping it well up toward the ridge.  
❖ With plate punch, punch holes all over the plate. If clasps are to be  
❖ used, they should be soldered to this gold plate. A few stays are sol-  
❖ dered to the plate to keep it firmly attached to the model during the  
❖ flasking and vulcanizing processes. The plate is fitted accurately to the  
❖ model and the teeth set up. This plate, or 'strengtheners,' produces a  
❖ plate which has the advantage of the maximum of strength and the  
❖ minimum of thickness. The object of the vulcanite covering is partly  
❖ because of the exposure, but also because vulcanite is more easily  
❖ adapted to the rugae of the palate and fits better. If one wishes to  
❖ have a trial plate, the vulcanizing can be done before the teeth are set  
❖ up, and the teeth may be attached at a second vulcanization."



HERE IS A PRETTY old letter, but now that the war makes it difficult to

❖ get so many things, we may run out of separating silk, and the sugges-  
❖ tions herein contained may help some one. In the Items of Interest  
❖ for January, 1913, Dr. Van Woert described and illustrated a method of  
❖ separating teeth with silk. He received the following letter from Dr.  
❖ Edward L. Wharton, of Newark. After a few preliminary remarks he  
❖ says: "I think you will be interested in the use of ordinary sewing tape  
❖ for separating teeth. It has all the advantages of the ligature silk of  
❖ which you speak, and which I used before using this tape, and to my  
❖ mind the following additional advantages: The entire operation can  
❖ be done by the patient, thereby taking none of the dentist's time. Any  
❖ amount of separation can be gained, and if the cavity extends beneath  
❖ the gum it will force the gum back so as to expose the entire cavity,  
❖ by the simple expedient of using wider tape. The method is as follows:  
❖ If the appointment for the actual work is to be on Wednesday, I ask  
❖ the patient to put a piece of tape between the teeth on Monday night  
❖ and cut it close to the teeth both front and back. Tuesday morning put  
❖ in two thicknesses; Tuesday night three, and Wednesday morning four.  
❖ Unless the teeth are very close together the patient can do this easily.  
❖ If they are too tight together I use the immediate separator and put  
❖ in the first tape myself."



THIS METHOD IS VERY OLD, of course. Probably much older than Dr.

❖ Wharton. Yet in some respects it is a good method. Old jokes, you  
❖ know, are always good. Fact is, if a joke is poor it dies young. Dr.  
❖ Wharton's letter is printed, however, because besides the good method  
❖ which he describes it suggests certain comments which may be helpful.  
❖ For example, he tells us that with tape of sufficient width gum tissue  
❖ may be pressed away from the gingivus. Let it not be forgotten that



## Items of Interest

- ❖ the major part of all pain produced whilst separating teeth is due to pressure against the gum. The one prime advantage in the ligature silk method is that as it contracts around the contact point it likewise draws away from the gum, and that is the secret of its painlessness. If one must force gum tissue away, there is the old reliable method of packing the cavity with cotton saturated with sandarac varnish. A cleaner and just as effective method is to pack the cotton and sandarac between the teeth and tight against the gum and then fill the cavity proper with base plate gutta percha. If possible, leave this for a week, or even longer.

□   □   □

TO FORCE GUM AWAY from the margins of labial or buccal cavities use

- ❖ gutta percha. Where the cavity is shallow, a ligature silk should be tied around the tooth and over the gutta percha while the latter is still plastic. With a warm burnisher then pack the gutta percha tight. In two days the gum will have moved away so that an impression of the cavity can be taken which will show the gingival margin clearly defined. The cavity should be repacked between sittings if an inlay is to be made. At the second sitting frequently the rubber dam can be used. In the anterior teeth, if a cervical clamp cannot be placed, the dam can be kept above the cervical border by using a part of a small steel pin, and tapping it gently directly into the dentine at the tooth neck and above the cavity border.

□   □   □

REVERTING TO THE MATTER of separating teeth, it is precisely where

- ❖ teeth are very tight together that the ligature silk surpasses tape. There is almost no condition in which ligature silk cannot be used, whereas many places, notably between molars, cannot be treated with the tape at all. The tape, however, is often preferable in the front of the mouth, though it would seem best for the dentist to place at least the first piece himself. Some years ago Dr. C. Frank Bliven, of Worcester, introduced a tape coated with gutta percha. This was much more efficacious and more cleanly than the tape alone. Out Chicago way they steep the tape in white wax, and they say "it beats all." But you know how those Chicago fellows talk!



### Extraction of Wisdom Teeth.

Editor ITEMS OF INTEREST:

*Dear Sir:*

Criticism from the competent, like discussion with the learned, is as helpful as it is welcome.

The unthinking and the inexperienced frequently indulge in superficial comment which, unchallenged, passes for knowledge.

To be helpful, criticism must be constructive. All students seek constructive information even if it be in disagreement with their own views.

In the ITEMS OF INTEREST for October I note a letter from Dr. W. H. Jones of Columbus, Ohio, in which my paper on "Wisdom Teeth," published in your August number, is "discussed." The letter serves but one useful purpose—it demonstrates the very marked advance of the dental profession. That the retrogression of Dr. Jones was thereby advertised is unfortunate.

Dr. Jones is certainly living in the past when he compared the present-day extracting specialist, or exodontist, with the "puller of teeth" and "easy ones too." The puller of teeth of Dr. Jones's present-day acquaintance was eliminated from professional consideration many years ago. The exodontist of to-day is a respectable member of society in the community where he resides and is a welcome member of all the societies, National, State and Local. Dr. Jones seems ignorant of these facts. As for the "easy ones too," except those teeth which are lost from pyorrhea the extracting specialist has no easy ones to extract.

In our larger cities most of the dentists do not extract at all but send such cases to the exodontist. They are generally teeth which have been drilled and reamed for posts in crown and bridge work until further effort for their retention is useless. These are not easy ones.

Other dentists do such as they can and send their difficult ones to the exodontist. Some use local anesthetics and recommend only those they have broken, none of which are easy by any means. Dr. Jones simply does not know.

Dr. Jones is careless in his reading. In the article referred to there is not a word about recommending operations for impacted or any other tooth to a regular surgeon.

The exodontist is perfectly familiar with the concomitants, eye, ear, nose and infections shown in clinical exhibitions as the results of lesions produced by these perverts. His abilities as a diagnostician are generally recognized by members of the medical profession and he is frequently called in consultation by the regular surgeon in these cases, but it would never occur to the writer to refer any case of impaction to the regular surgeon. The ones Dr. Jones speaks of, being supposedly those described under class four in the article published in your August issue as subject to a major operation, were spoken of as being recommended to the oral surgeon; the distinction between the regular and the oral surgeon Dr. Jones seems to fail of comprehension. The reason for recommending these major cases (No. 4) to the oral surgeon is not from lack of ability or skill in operating on them, but the busy exodontist cannot control his practice by appointments. He has his office hours from 9 a. m. to 4 or 5 p. m. as the case may be, and his only time to devote to them would be evenings or Sundays. We have several oral surgeons, M. Ds. and D. D. Ss., of excellent repute, and we have right here in Philadelphia Dr. M. H. Cryer the Dean of the Clan, and as these cases require ether anesthesia and hospital treatment the writer deems it good and liberal practice to pass them along.

Dr. Jones shows one gleam of lucid mental preception in his remark about the ruthless extraction of the second molar described under class 3, which draws attention to what may be a fact, that the writer may have failed to make the point clear. There certainly was no recommendation of ruthless extraction of the second molar for the relief of suffering caused by the slanting wisdom tooth. Indeed, in very few instances is such sacrifice necessary.

The cases under discussion were those slanting ones with crowns pressing against the posterior root far below the enamel collar of the second molar which makes their extraction almost impossible, even with bur and chisel without removing the second molar or, if this is not taken at the time of the immediate operation, the injury is so great that its loss is inevitable in the very near future, but why take both of them?

The recommendation is to remove the second molar and leave the wisdom tooth for further development.



Being free from caries and given room from its confined surroundings, whether straight or slanting it is better there than no tooth at all, and given space for its eruption without obstruction it can be the cause of no more trouble, local or otherwise than any other healthy tooth. So I repeat, "Why take both?"

It is very evident that Dr. Jones is living in the times of the "puller of teeth" and it might be well to suggest that he accelerate his gait and come along with the procession.

Sincerely yours,  
J. D. THOMAS.

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### Correction.

Editor of ITEMS OF INTEREST:

Dear Sir:

In the report of my lecture before the Central Dental Association of Northern New Jersey, appearing in the ITEMS OF INTEREST for November, I find that I neglected to state that the photograph of the mandible of the lower jaw is from the Miller Collection at the University of Michigan.

Yours very truly,

M. L. RHEIN.

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### Local Anesthesia.

Editor ITEMS OF INTEREST.

Dear Sir:

In Dr. Stern's recent article (Local Anaesthesia in Operative Dentistry) published in the September, 1915, ITEMS OF INTEREST, there appear several conflicting statements that in my opinion need rectification.

First: The essayist, like so many other writers on this subject, persists in using and advocating the pumping motion of the syringe when performing the maxillary tuberosity and mandibular injections, and I suppose in the infra-orbital as well. Now, this "moving the syringe backwards and forwards" as the essayist advises, this pumping motion was advocated several years ago, and its purpose was to prevent the needle-point from remaining in the artery, had it by ill-luck entered one. It becomes, however, immediately apparent to any one who stops to consider it that, should the needle luckily miss puncturing an artery (as it always does) upon its initial full insertion, the advocates of this technique would give it (the needle) fifteen to twenty more chances by their repeated jabs. Moreover, since the syringe is never held so steadily, nor the jaws so motionless as to prevent the needle from deviating upon each successive pump from its initial path, it follows that not only are the chances increased for the very thing

they wish to avoid, but the chances for post-operative pain and trismus as a result of the laceration that the tissues are subjected to, are almost guaranteed.

I refrain from saying more than a word of the impossibility of this occurring accidentally, and of the difficulty I have experienced in endeavoring to inject an artery in the living subject intentionally. The reason for this is, of course, due to the slippery resilient coat and to the comparative dullness of the ordinary needle. Of arterial anesthesia, Prof. Braun says, "it is of value in tubercular patients, in the aged with bronchitis and heart lesions, and other cases which are not suitable for general anesthesia."

The essayist on page 655 of the same issue writes as follows: "Infiltration anesthesia seems to involve a slight danger to the pulp, as may be observed in the following cases recorded, all injected for the purpose of preparing cavities where the dentine was highly sensitive. Most of these cavities were superficial.

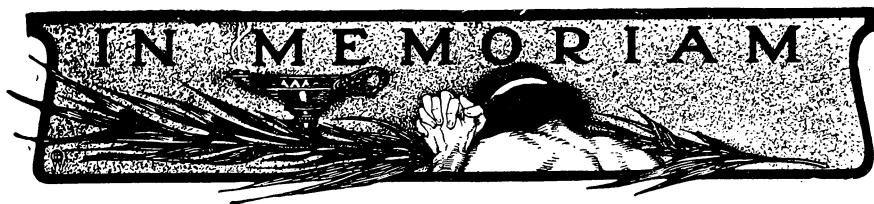
Method	Number of Cases	Hyperaemia	Death of Pulp
Infiltration .....	86	9	2
Conductive .....	193	None	None

While the essayist employs the term "seems" in his text his table is without it, thus implying definiteness without qualification. The "*slight*" danger that seems to be involved, we read, is nothing short of hyperaemia or death of the pulp. He farther remarks, "unfortunately I have no data as to the condition of the pulps prior to the injection." Which is sufficient to clear and exonerate the infiltration method. Though I rarely employ this method it is not because it is in the least dangerous but rather because it is somewhat painful, the injections being made into hard, firm taut gum tissue, whereas in the conductive regions the tissues are loose and cellular.

Novocain, characterized by its blandness whether injected perineurally, endoneurally or infiltrated, or when packed into an open wound will invariably permit the tissues to regain their normal state. In fact, novocain appears to hasten wound healing and even in operations for cleft-palate where undisturbed circulation is of the utmost importance, I have found it without fault. Furthermore, if a purposely infected solution be injected, say into the apical region of an incisor we would not only expect the death of the pulp but of the surrounding tissue. For, any contaminated solution passing through the lamella does not possess any *selective* action on the pulp, the pulp becoming affected only when the area concentric to it succumbs. The surrounding tissue remaining normal, one may rest assured that the pulp will not suffer.

Very truly yours,

S. L. SILVERMAN.



### **Memorial to Dr. W. Xavier Sudduth.**

Dr. W. Xavier Sudduth, a distinguished associate fellow of the American Academy of Dental Science, died at Roundup, Montana, May, 1915.

Dr. Sudduth graduated from Illinois Wesleyan University 1873, receiving the degree of M.A., graduated from Philadelphia Dental College 1881, and also studied in Heidelberg and Vienna 1888-1889. He practiced dentistry in Illinois for about two years, when he became connected with the University of Minnesota as Secretary of the College of Dentistry and Professor of Embryology, Oral Surgery and Pathology and was Dean from 1892-1895. He was also much interested in histology and the therapeutic use of hypnosis. His clinical work was oral surgery.

Dr. Sudduth was a man of marked ability, integrity, and resources. He wrote a great deal, contributing to text books, and at one time was Editor of the International Dental Journal. He went to Montana from Minnesota, taking up his special hobby of horticulture and cattle-raising. He was much interested in the subject of cattle-feeding which led him to the raising of alfalfa. He was known as the "Alfalfa King."

Resolved: That in the death of Dr. Xavier Sudduth the Academy mourns one of its most distinguished associate fellows, a man of marked ability and one who was ever an honor to his profession.

WILLIAM P. COOKE  
A. I. HADLEY  
HENRY H. PIPER.

---

### **In Memory of Dr. G. U. Black.**

It becomes the opportunity and joy of comparatively few members of a profession to know intimately its greatest leaders, but it is the privilege of all through imagination, sympathy and reverence to break down the barriers of time and space and enter into very vital relations with what is worthiest in the life of professional men.

With feelings like these the members of the American Academy of Dental Science desire at this time to honor the memory of Dr. Greene Vardiman Black whose recent death strikes from its honorary list a dis-

tinguished name and leaves the dental profession everywhere the poorer by his absence, but richer in the inheritance he has left behind him.

Dr. Black's life was unusually varied in its activities within the profession and singularly rich in its accomplishment. He was connected with three dental schools but his great work was done in connection with the Northwestern University Dental School at Chicago, in which he was a professor for twenty-four years and Dean from 1897 to the time of his death. Modest in demeanor, genial and kindly in his relation with his fellows he was yet filled with a passion to make real and practical what he felt to be important and to enrich the profession with the best of which he was capable. Honors and opportunity for service come unsought to such a man, and they came to him in full measure. He was president of the Illinois Dental Society, first president of the State Board of Dental Examiners, president of the National Dental Association and was awarded medals for his contributions to dental science and literature. His contributions to professional literature were especially numerous and important. For this and much besides it is a satisfaction to honor this eminent member of the dental profession, but it becomes a privilege to honor him in addition for his catholic spirit, his wide sympathy and his manliness. His life work retained interest for him to the last and with the memory of him there will always be mingled the thought of a well rounded character.

WILLIAM P. COOKE  
HENRY H. PIPER  
AMOS I. HADLEY.





### **State Society Meeting.**

OHIO STATE DENTAL SOCIETY, Columbus, Ohio, December 7-10, 1915.

Secretary, Dr. F. R. Chapman, 305 Schultz Bldg., Columbus, Ohio.

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### **American Institute of Dental Teachers.**

The annual meeting of the American Institute of Dental Teachers will be held at Hotel Radisson, Minneapolis, Minnesota, January 25, 26 and 27, 1916.

There will be a number of interesting papers, reports and discussions by prominent dental educators. All dental teachers are cordially invited to be present.

J. F. BIDDLE, Secretary.

517 Arch Street, N. S. Pittsburgh, Pa.

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### **Important Postponement.**

The meeting of the National Association of Dental Faculties which was to have been held in Minneapolis, January 28-29, 1916, has been postponed to meet in Louisville in July, 1916. The exact dates will be announced later.

B. HOLLY SMITH, Chairman Ex. Com.

### **Wisconsin State Board of Dental Examiners.**

The semi-annual examination of the Wisconsin State Board of Dental Examiners will be held at Marquette University, Milwaukee, Wis., beginning 9 A. M., Friday, December 17th. All applications must be in the hands of the Secretary by December 7th.

For further particulars write Dr. F. A. Tate, Rice Lake, Wis., Secretary.

---

### **Rutland County Dental Society.**

The Rutland County Dental Society held its first meeting of the season Wednesday evening, November 10th, and the following officers were elected for the ensuing year: President, Dr. Thomas Mound, Rutland, Vice-President, Dr. G. L. Gutterson, Fair Haven; Secretary, Dr. Grace L. Bosworth, Rutland; Treasurer, Dr. Paul H. Blanchard, Rutland.

Meetings are held once each month, and nearly every dentist in the county is identified with the Society, thereby making them interesting and profitable.

GRACE L. BOSWORTH, Secretary.

---

### **Name Advisory Board for Dental College.**

At a recent meeting of the Dallas County Dental Society, attended by members of the Faculty of the State Dental College, a resolution was unanimously adopted accepting a proposition whereby the management and direction of the college is placed in the hands of an advisory board composed of Dallas members of the County Society. This board was named as follows: Drs. Bush Jones, J. W. Halsell, A. L. Frew, S. L. Barron, J. R. Beachum, G. Waller Staples, J. J. Simmons and C. L. Morey.

After the meeting of the County Society the Advisory Board went into session and elected the following officers: Dr. J. S. Simmons, President; Dr. Bush Jones, Vice-President; Dr. C. L. Morey, Secretary; Dr. J. W. Halsell and Dr. A. L. Frew, new members of the Board of Directors.

The proposition to the above effect was made by members of the Faculty of the State Dental College to a committee of the County Society, and was generally discussed at last night's meeting and met with unanimous endorsement. The Board will take charge of the management of the College at once.

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December  
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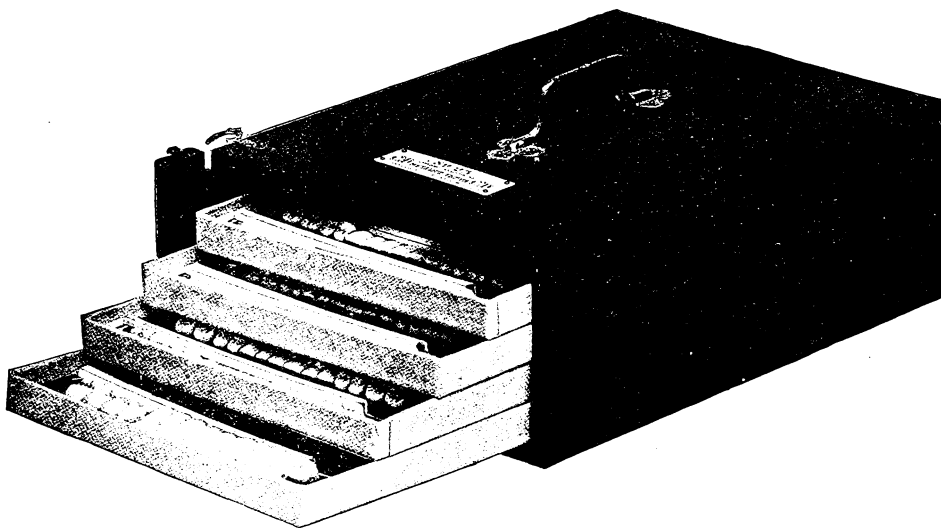
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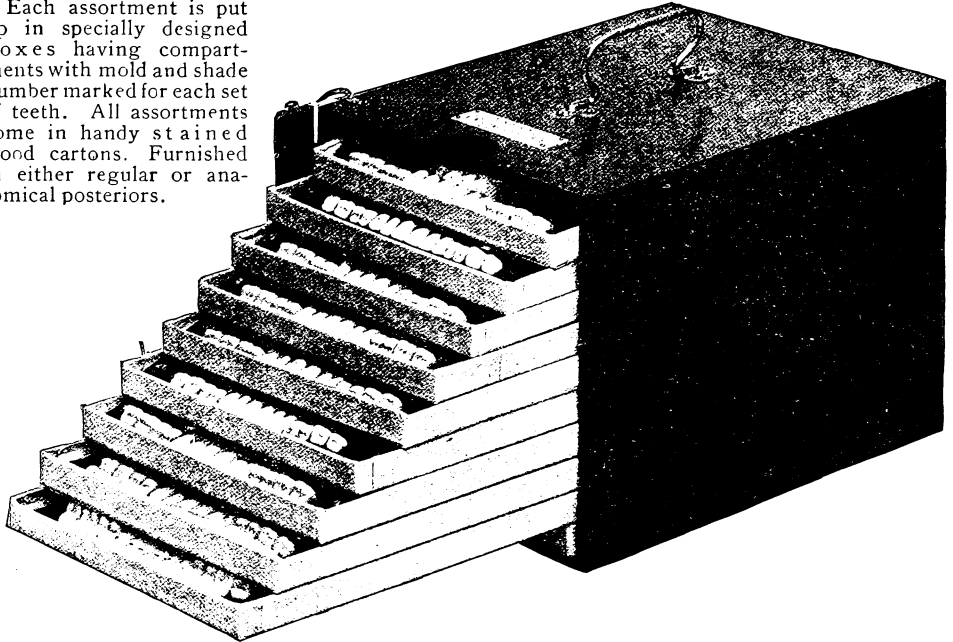
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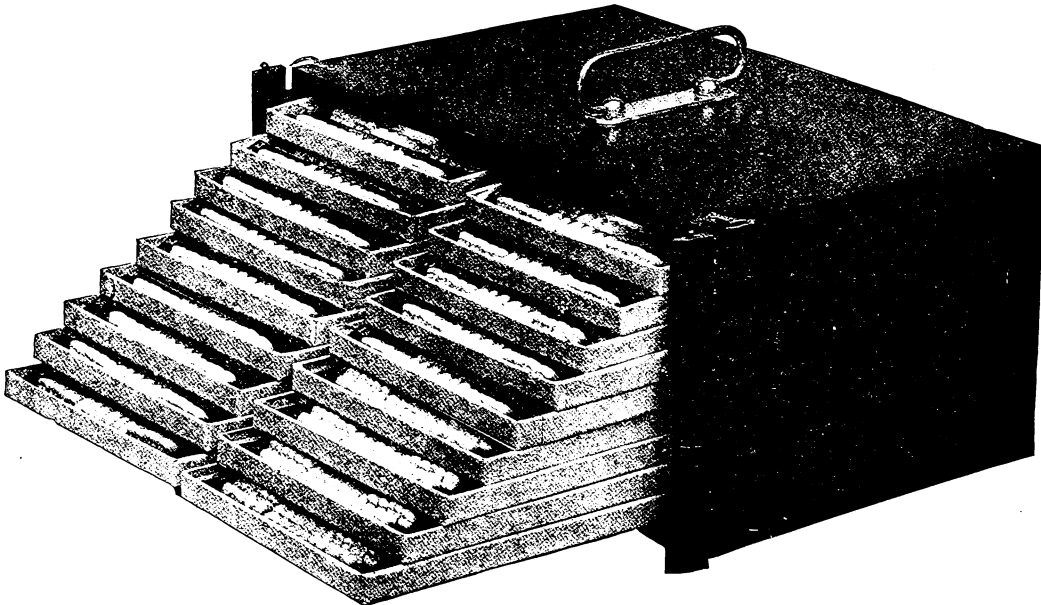
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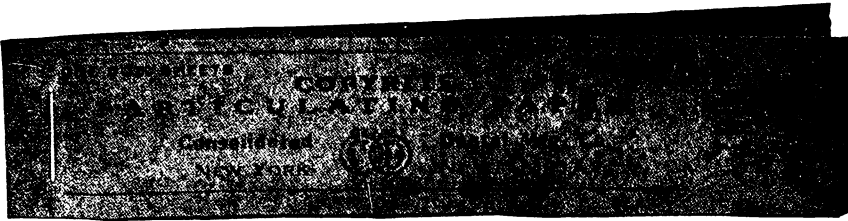


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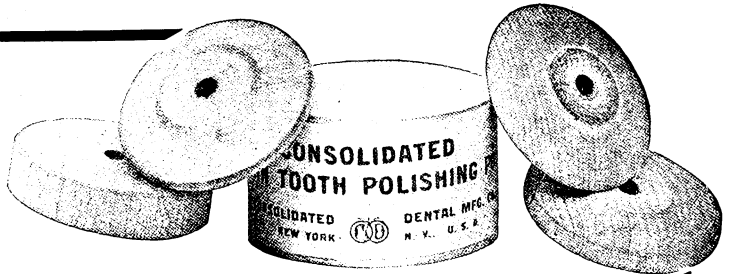
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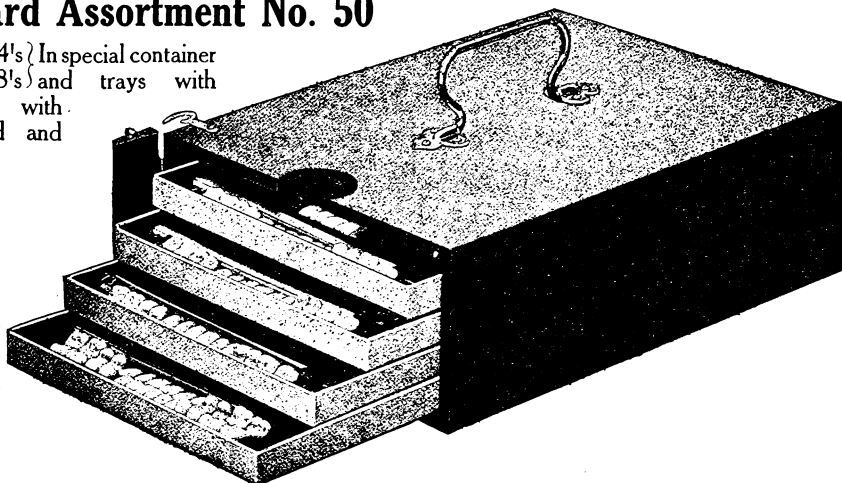
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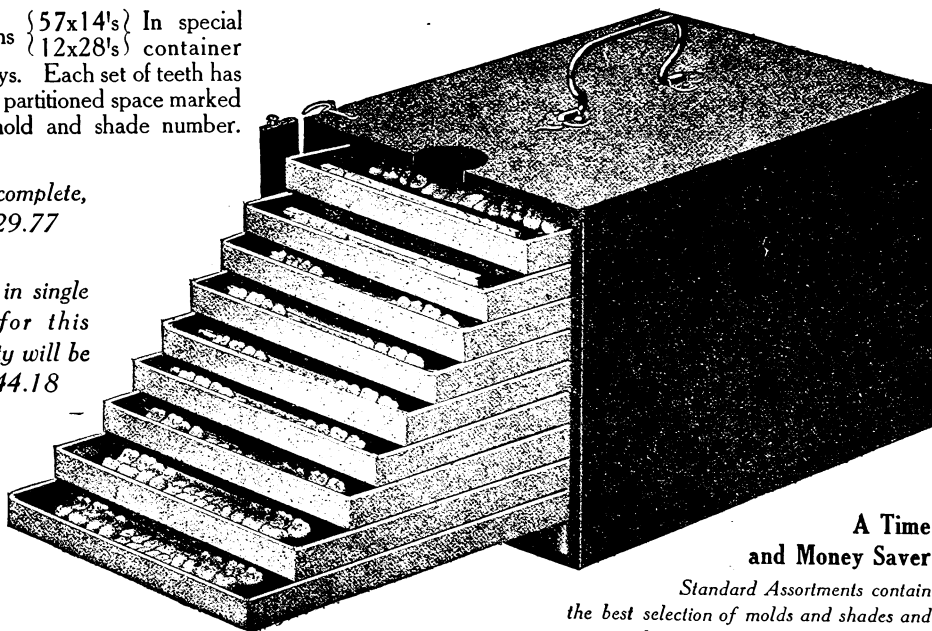


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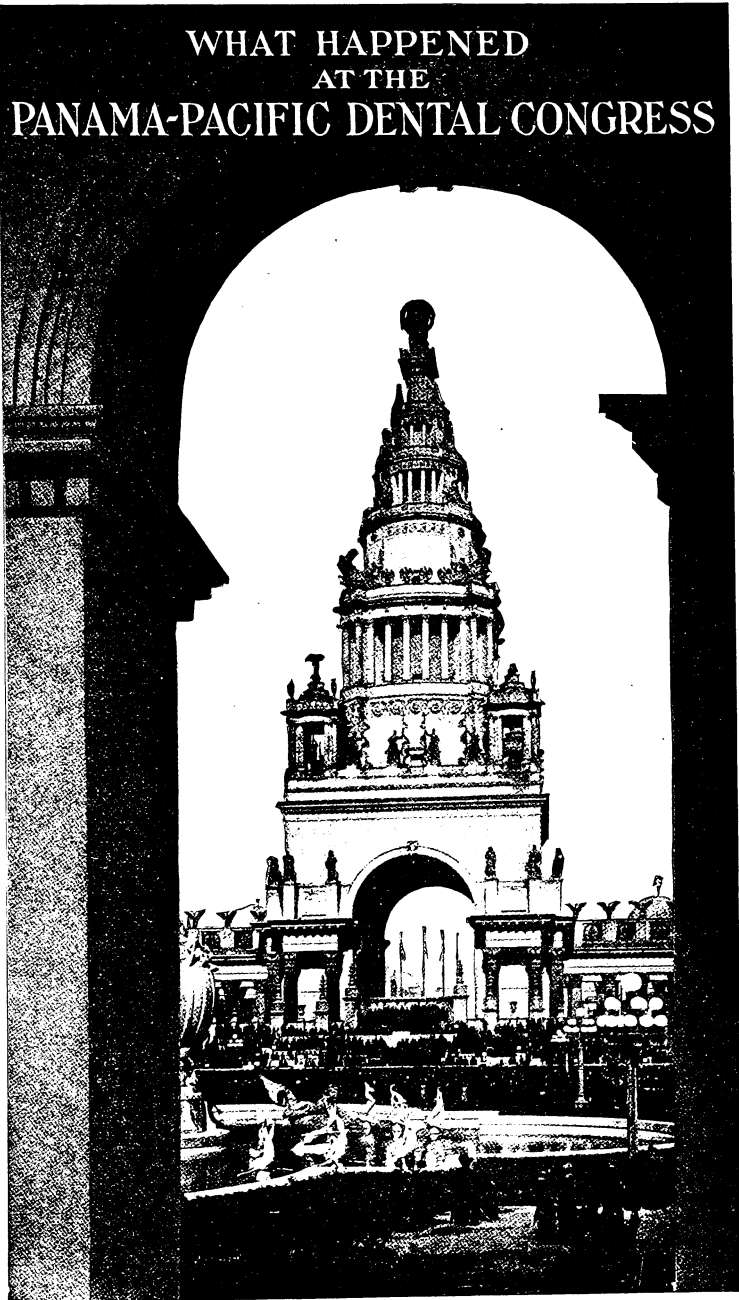
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"Glide-Overs" are admired for their running qualities. They glide over the pulleys quietly, with minimum jar and vibration. They are made of a specially woven, tough fabric which prevents slipping and makes them more durable and serviceable than leather. The belting is magical in the smooth, easy, powerful running it imparts to the hand-piece; it grips the pulleys.

**Dr. J. E. Aigley, Farmington, Ill., writes:—**

**"Please send me Endless Engine Cord 2 ft. 2 inches long. Some time ago I purchased a cord from you; it was the best I ever had. Would like to get one just like it."**

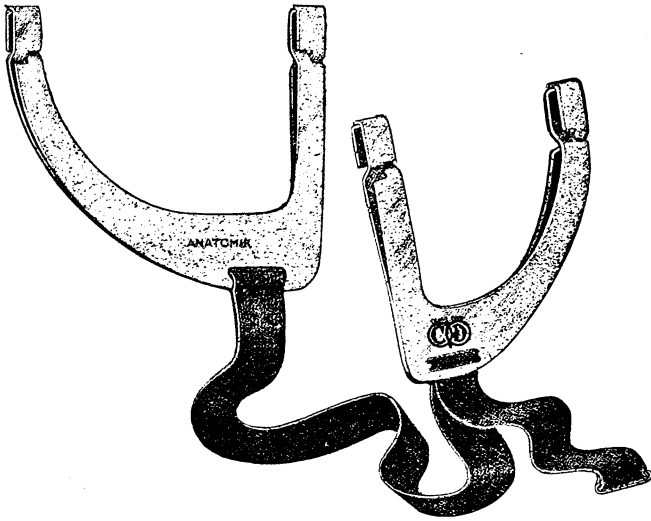
## PRICES

No. 1.	Endless Belt for side-wheel Engines, "E. & J.," each.....	\$ .24
No. 2.	Endless Belt for side-wheel Engines, "F. & G." or "K. & L.," each.....	.24
No. 3.	Endless Belt for Consolidated and side-wheel Engines, "H. & M.," each.....	.24
No. 4.	Endless Belt for Weber-Perry Engine.....	.30
No. 5.	Endless Belt for Consolidated All-cord and Doriot Engines.....	.30
No. 6.	Endless Belt for Consolidated All-Cord Engine.....	.30
No. 7.	Endless Belt for Columbia All-cord Electric Engines up to and including 197, each.....	.28
No. 8.	Endless Belt for Columbia All-cord Engines above No. 197, each.....	.32
No. 9.	Endless Belt for Columbia Cord Suspended All-cord Engines, for either alternating or direct current, each.....	.30
No. 10.	Endless Belt for Columbia Folding Bracket Engines Nos. 6 and 7.....	.30
No. 11.	Endless Belt for Columbia Folding Bracket Engines Nos. 8 and 9.....	.30
No. 12.	Endless Belt for "S. S. W." Folding Bracket Cable Engine.....	.45
No. 13.	Endless Belt for "S. S. W." Folding Bracket Belt Engine.....	.45
No. 14.	Endless Belt for "S. S. W." Swivel Bracket Cable Engine.....	.45
No. 15.	Endless Belt for "S. S. W." Swivel Bracket Belt Engine.....	.55
No. 16.	Belt for Register All-cord Engine No. 1 or No. 11.....	.25
No. 17.	Belt for Register Corded-cable Engine, No. 2 or No. 22.....	.25
No. 18.	Belt for No. 4 Arm (old model) on Foot Engine base.....	.30
No. 19.	Belt for No. 45 Arm on Foot Engine base.....	.30
No. 20.	Belt for No. 45 Arm on Folding Bracket Engine.....	.25
No. 21.	Belt for Cable Arm on Folding Bracket Engine.....	.15
No. 22.	Belt for No. 5 Short All-Cord Arm in Folding Bracket Engine.....	.25

NOTE.—When ordering belts for engines requiring special size of belt, give the exact length, which can be found by improvising a belt with a piece of twine and measuring the length of same.

CONSOLIDATED  DENTAL MFG. CO.

# Anatomik Rubber Dam Holder



Simplicity, convenience and efficiency in the proper adjustment of Rubber Dam is combined in this holder. The spans are not only of the proper shape and size to stretch the dam, but they are also flat and smooth and conform to the patient's face and jaw.

The proper tension is easily secured by the elastic band and held permanently without buckles or clamps. The Clasps grip the rubber dam and regardless of the tension will not let go until they are opened.

The use of the Anatomik enables you to dispense with weights and other appliances.

Price, complete . . . . . \$1.00

**CONSOLIDATED  DENTAL MFG. CO.**

Main Office: 130 Washington Place, New York, N. Y., U. S. A.

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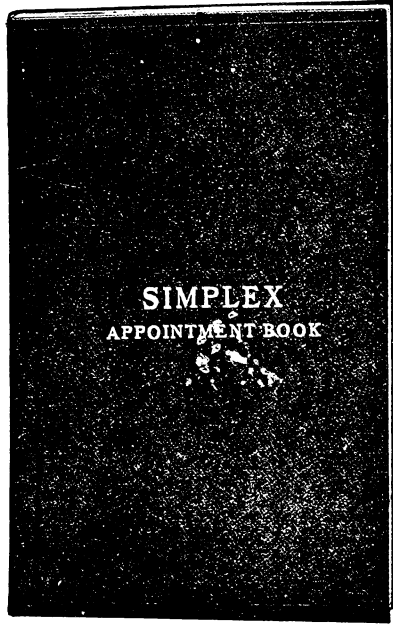
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# SIMPLEX APPOINTMENT BOOK



114 pages for Day Appointments.

48 special pages for Evening Appointments on colored paper.

Extra wide spaces between lines.

Pocket size,  $4\frac{1}{2} \times 7$ .

Strong Black Leather Binding, reinforced.

Gilt Edge and Gilt Lettering.

Ribbon Book Mark.

Finest Bond Paper.

Not dated—no waste if not used daily.

Three yearly calendars.

Refined and Elegant.

Price 65 cents.

CONSOLIDATED  DENTAL MFG. CO.

# Do YOU Have Difficulty in Collecting Accounts?

YOU want the money to meet your own obligations, but as a professional man, you have no business method of collecting it.

## *The* Trigg's Chart System of Collecting Accounts

therefore, exactly fills your requirements.

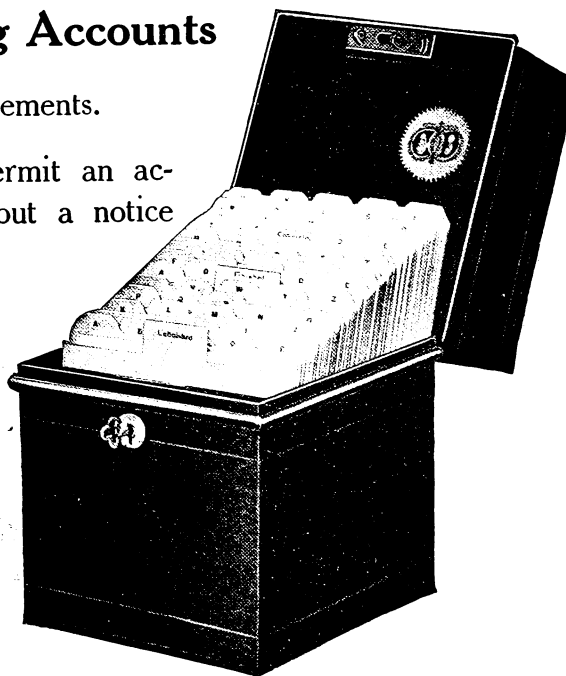
It is automatic and will not permit an account to become overdue without a notice to the debtor.

It gets the money.

Isn't that worth \$5.00 to you?

### PRICES

No. 865—A Antique Oak Case, filled	- - -	\$9.00
" 865—B Japanned Tin " "	- - -	5.00
" 865—C " " small	- - -	5.00
" 865—D Charts, per hundred	- - -	.75
" 865—E Indexes, including Center Guide	- - -	.50
" 865—F Complete Set of 3 Indexes	- - -	1.50
" 865—G Cash Acc't Cards, per hundred	- - -	.90



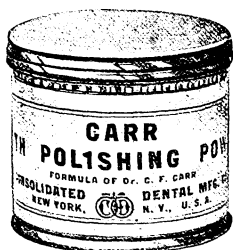
## CONSOLIDATED DENTAL MFG. CO.

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Half size

# Carr's Tooth Polishing Powder

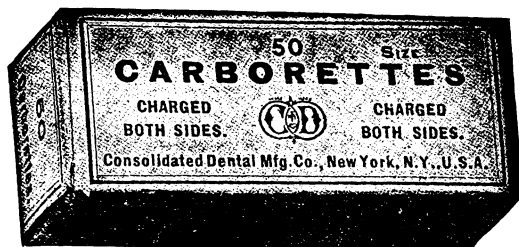
For cleansing and polishing the teeth quickly yet without the sharpness and grit of pumice. It is most efficacious when used with moosehide points. Specialists in prophylactic work use Carr's Polishing Powder almost exclusively in place of flour of pumice. In compounding this special powder, Dr. Carr's long experience as a pyorrhea specialist enabled him to provide for all the requirements and desirable properties that a prophylactic polishing powder should have.

PUT UP IN SUBSTANTIAL CONTAINERS

**Price, per pkge.—\$.30**

*For sale by all leading dental dealers*

**CONSOLIDATED  DENTAL MFG. CO.**



Thin Separating Disks charged with Carborundum on both sides, or one side only. An excellent disk at a low price.

In boxes of 50 each—Price \$1.00 per hundred.

Sizes:  $\frac{1}{8}$  in.,  $\frac{3}{16}$  in.,  $\frac{1}{4}$  in.,  $\frac{5}{16}$  in.

**Consolidated  Dental Mfg. Co.**

# Ajax Floss Silk

PERFUMED  
STERILIZED

A TOILET NECESSITY TO PREVENT DECAY OF TEETH,  
RIGG'S DISEASE AND OTHER AFFECTIONS OF THE GUMS.

THE CHARM OF A SWEET MOUTH  
THE BREATH OF GOOD HEALTH  
THE BEAUTY OF PERFECT TEETH  
THE ADVANTAGE OF SOUND TEETH



## Practical Prophylaxis

After you have given your patients prophylactic treatment, teach them how to co-operate with you in keeping their teeth clean. Present them with a bottle of

# AJAX FLOSS SILK

### PRICES

12 yards, waxed,	\$0.12 per spool	-	\$1.25 per dozen	-	\$14.00 per gross
24 " "	0.20 " "	-	2.00 " "	-	23.00 " "
150 " "	1.00 " "	-	11.00 " "	-	

CONSOLIDATED  DENTAL MFG. CO.

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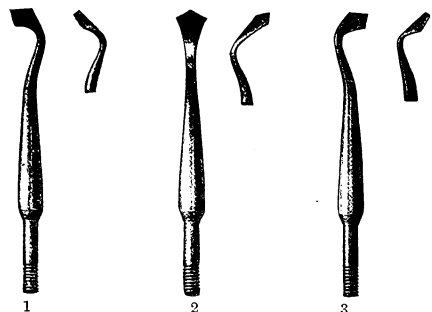
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Cleveland, 991 Colonial Arc.

Boston, 120 Boylston Street

New York, 45 West 34th Street

# Frahms Carving Instruments



## for Wax and Amalgam

*For the anatomical restoration of articulation and occlusion, restoring to normal masticatory form and function, the broken down cusps of decayed teeth.*

277-D Long Octagon Handle - - Each \$8.65

277-E Socket Handle - - - - - .50

Made in three angles - - 70, 90, and 105 Degrees.

Unless angle is stated, 90 Degrees is always sent.

THE technic of using these instruments, whether in the mouth or upon the model, is as follows: In the case of the lower first molar, with a restoration filling the fossa, select the straight instrument (Fig. A). Place the blade opposite the point where the buccal fissure joins the central fissure (*a*, Fig. B); the instrument is imbedded in the wax or amalgam to full depth of fissure. Draw the instrument forward, both inclines of blade cutting to full depth and width of fissure, until the anterior occlusal fossa is reached (at *b*), then take either right or left instrument, according to position of tooth, place it in the fossa end of the buccal fissure (*a*), pass toward buccal side with blade following line of the fissure and buccal groove, raising as end of fissure is reached at (*c*); then take the straight instrument again, place in centre of occlusal fissure and cut diagonally backward and lingu-ally to the point of junction of lingual fissure with central pit (*d*); then selecting either right or left instrument cut lingual occlusal fissure same as buccal (*e*). Now take straight instrument and cut from lingual pit (*d*) distally to the juncture of the distal with the disto-buccal fissure (*f*). Then to finish these select a right or left instrument, according to position, placing instrument in distal pit (*f*) and cut buccally and then lingu-

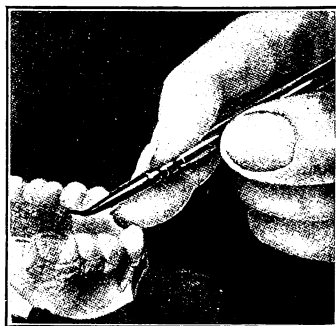


Fig. A

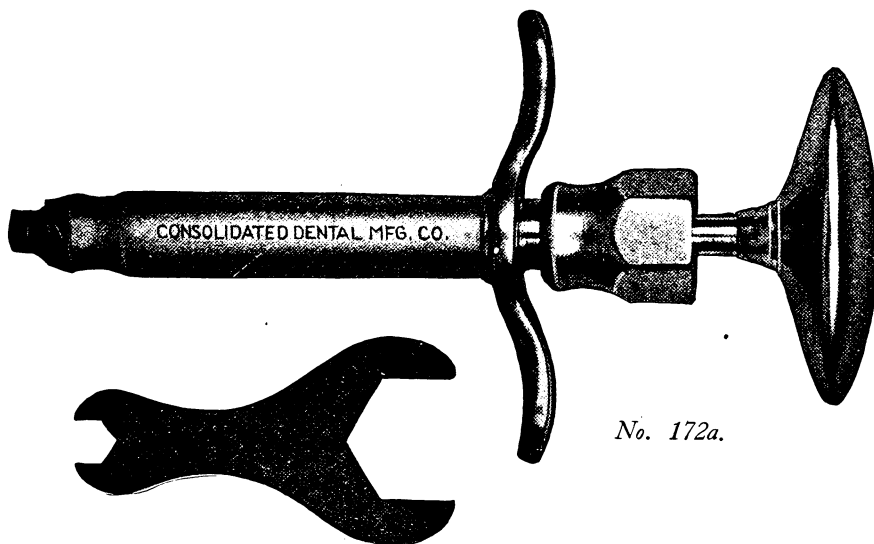


Fig. B

ally to points *g* and *h*, keeping one edge of cutting blade resting upon cavity margin, or, in the case of a compound filling, upon the matrix; or, in the case of a wax inlay, it may be held at just the right angle to cut and leave the proper height distal cusp. To finish the mesial marginal pit, use right and left instruments, cutting buccally and lingually from centre (*b*) of pit to *i* and *j*. After this the supplemental developmental fissures are put in by sidewise pressure of the instrument. The occlusal surface of the wax is left smooth and polished by these instruments, which are used cold. In using these instruments on an occlusal surface, begin to cut in a pit and end in a pit, raising the instrument if going over a ridge. In finishing buccal and lingual fissures decrease pressure as instrument approaches end of fissure. In premolars start in one pit and cut toward triangular ridge, releasing pressure when passing over the ridge, then increase pressure toward other pit, either with draw or push cut. Finish marginal ridge and pits same as in lower molars. In carving restorations in the upper molars, the same technic prevails, only modified for the anatomy of the tooth. No subsequent polishing of the filling with a rotary cutting instrument is permissible. In fact, the only finishing needed is burnishing with a tantalum instrument, which is harder than steel.

CONSOLIDATED  DENTAL MFG. CO.

# CONSOLIDATED ALL-METAL HYPODERMIC SYRINGE



No. 172a.

With powerful oval handle, remarkable suction and compression. Compression packing which can be tightened easily to take up wear and shrinkage. The most simple syringe, yet having the maximum efficiency.

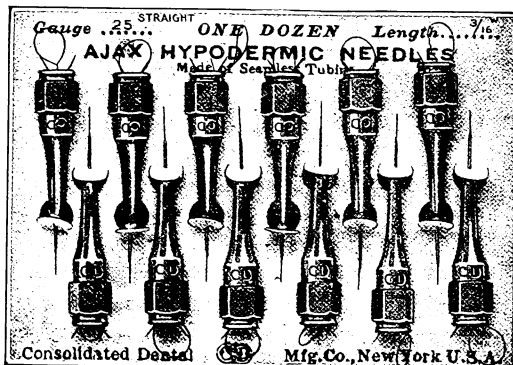
**PRICE, including Duplex Wrench, \$1.50**

## AJAX HYPODERMIC NEEDLES

*Reliability Guaranteed*

Hexagon Hubs, polished, non-tearing, razor-edge, extra strong. All gauges, straight and curved, all tested, carefully selected.

PRICE: Straight or curved,  
Per dozen - - - \$1.00  
Per half gross - - 5.50



## CONSOLIDATED DENTAL MFG. CO.

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Chicago, 29 E. Madison Street

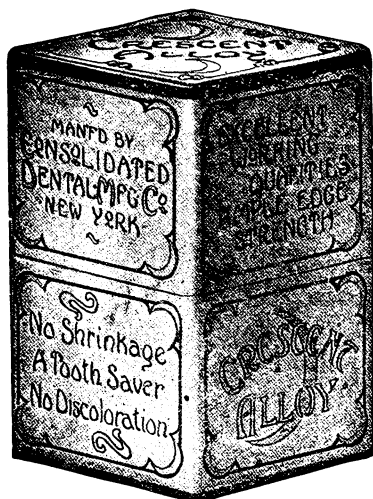
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# Crescent Alloy



The edge-strength of *Crescent Alloy* is remarkable. It can be ground to a razor edge and it holds like steel.

It does not shrink or discolor if used with pure mercury.

\$1.50 per oz.

\$7.00 for 5 ozs.

\$13.50 for 10 ozs.

\$25 for 20 ozs.

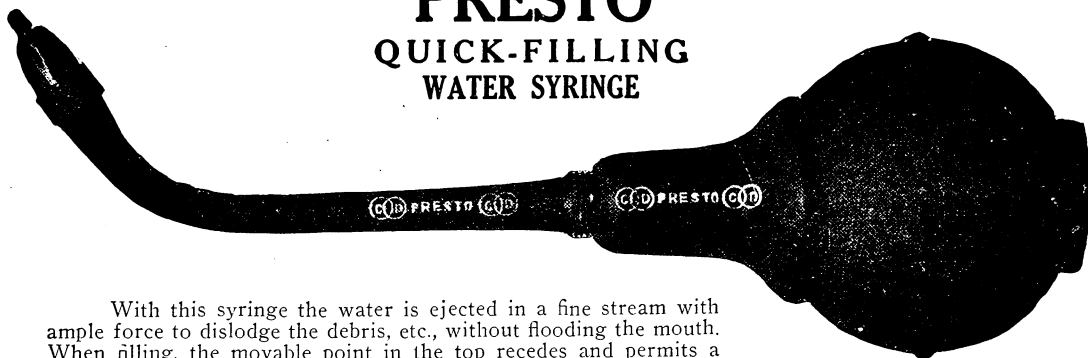


**CONSOLIDATED**



**DENTAL MFG. CO.**

## PRESTO QUICK-FILLING WATER SYRINGE



With this syringe the water is ejected in a fine stream with ample force to dislodge the debris, etc., without flooding the mouth. When filling, the movable point in the top recedes and permits a rapid intake through a large opening.

The bulb is powerful and fast and all the parts are simple and strong. By using a specially designed bulb and stem, there is no leakage between these parts, and no wires or other makeshift attachments are required to hold the bulb on the stem.

None of the parts is interchangeable with those of other makes.

**Price, . . . \$1.00**

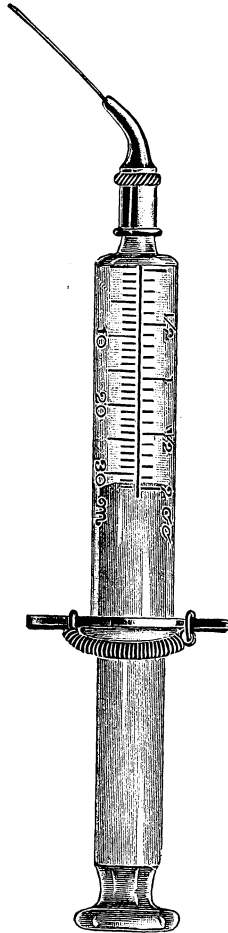
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# THE EM-PYR (Emetin) (Pyorrhea) SYRINGE

For flushing pus-pockets with Emetin solution

All glass, 30 minim,  
with Platinum  
Pyorrhea Point  
(blunt)

Complete Outfit  
in box \$2.00

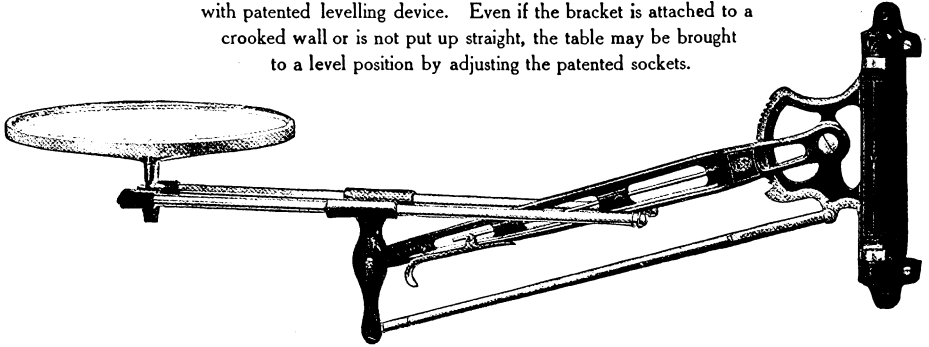


CONSOLIDATED  DENTAL MFG. CO.

# The New Consolidated No. 9 Bracket

is the longest, the strongest, the best looking dental bracket

with patented levelling device. Even if the bracket is attached to a crooked wall or is not put up straight, the table may be brought to a level position by adjusting the patented sockets.



9-A Nickel Plated without table \$18.00

9-B Black Enamelled without table \$15.00

9-M Mahogany Finish without table \$18.00

9-C Oxidized Copper without table \$18.00

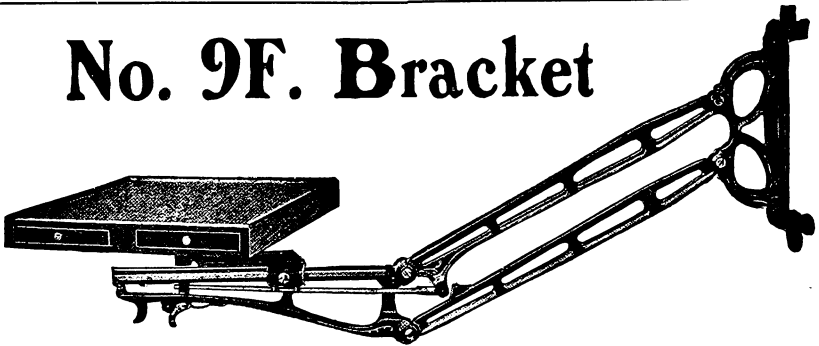
9-E White Enamelled without table \$18.00

9-O Gray Enamelled - - \$18.00

For Sale by all leading Dental Dealers

**CONSOLIDATED**  **DENTAL MFG. CO.**

## No. 9F. Bracket



This bracket is a decided favorite with many dentists. It can be raised or lowered with one hand and has a wide range—both vertical and horizontal.

In addition to possessing those mechanical qualities which make this bracket so popular, Consolidated No. 9F Brackets are characterized by a surpassing richness of finish. The enamel is hard, smooth and will wear well because it has been well baked. The enamel is relieved by pleasing gold decorations.

Made in four finishes—black, white, mahogany and gray.

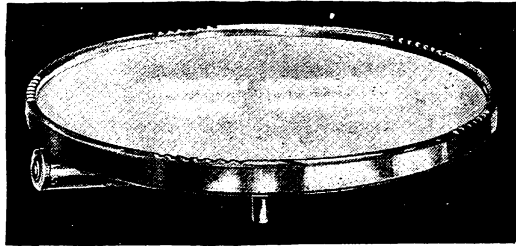
### PRICES

No. 9F, black enamel.....	\$12.00
No. 9G, white enamel.....	15.00
No. 9N, mahogany.....	15.00
No. 9P, gray enamel.....	15.00

**Consolidated**  **Dental Mfg. Co.**

# Old Dental Furniture

no matter how durable or substantial, is dangerous because it is dirty, unsanitary and uncleanable.



**The Consolidated Aseptic Bracket Table**  
*Sterilizable*

If you are not using an aseptic bracket table you are doing yourself an injustice. Most dentists have them and their patients know the difference. Oral Hygiene education has enlightened the public to present day methods and equipment.

The Consolidated Table is sold by all dental dealers.

Price, with vitrolite or polished plate glass top.....\$10.00

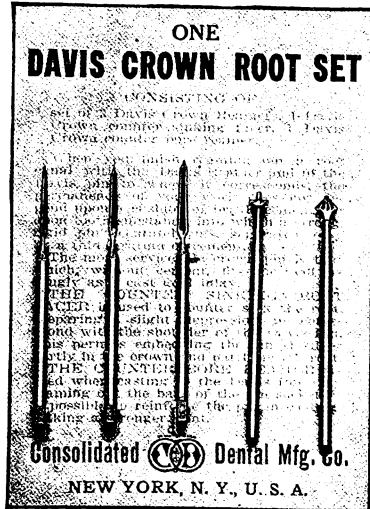
With special cotton receptacle and all metal alcohol lamp..... 12.50

**CONSOLIDATED  DENTAL MFG. CO.**

# The Davis Crown Root Set

CONSISTING OF

1 set of 3 Davis Crown Reamers, 1 Davis Crown COUNTER SINKING FACER,  
1 Davis Crown COUNTER BORE REAMER.



The most serviceable crown pin is that which, without cement, fits the root as snugly as a cast gold inlay.

With the 3 blade DAVIS CROWN REAMER, the root canal is opened to correspond exactly with the size of the Davis Crown Pin to be inserted into it. The minimum of tooth structure is removed and the pin fits perfectly its entire length without depending upon a stuffing of cement.

THE COUNTER SINKING ROOT FACER is used to counter sink the root preparing a slight depression to correspond with the shoulder of the Davis Pin. This permits embedding the pin shoulder partly in the crown and partly in the root.

THE COUNTER BORE REAMER is used when casting to the Davis Pin. By reaming out the base of the pin socket, it is possible to reinforce the pin in casting, making a stronger joint.

PRICES - - - Each \$ .35  
Per Set 1.50

For No. 2 and Davis Right Angle, No. 7 and All-Cord Handpieces. Specify fit when ordering.

The Reamers are made in three sizes to correspond with the three sizes of Davis Crown Pins.

## CONSOLIDATED DENTAL MFG. CO.

New York, N. Y., U. S. A.

# The Consolidated Crown Slitter

WITH it you can take off the crown almost without the patient's knowledge. It saves the patient from torture and enhances your reputation for gentleness. It will cut a crown anywhere—front, back or side, and a single compression of the handles does it.

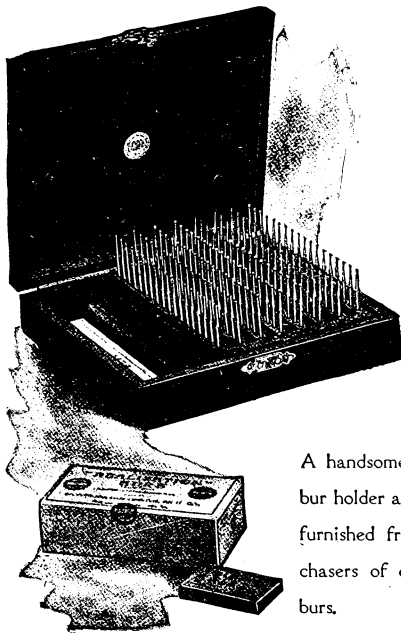


**Price \$3.50**

AT ALL DENTAL DEALERS



Consolidated  Dental Mfg. Co.



A handsome mahogany bur holder as illustrated furnished free to purchasers of one gross of burs.

## Realization Burs

This is what you should realize:

**Realization Burs**

do not grind.  
do not chatter.  
do not heat rapidly.  
hold their razor edges.  
are smooth and quiet cutters.  
are the least painful to the patient.  
shave dentine rapidly and smoothly.  
make excavation comparatively easy.  
reduce the strain on patient and operator from 50 to 100 per cent.  
are made accurately by machine.  
save your hand piece.



### EXCAVATING BURS

\$1 doz.	\$5.50 half gr.	\$10 gr.
Nos. 9 to 11 Large Round		
\$1.50 doz.	\$8 half gr.	\$15 gr.
Nos. 55½ to 63		
\$1.25 doz.	\$7 half gr.	\$13 gr.

### ENAMEL BURS (Round)

\$1.25 doz.	\$7 half gr.	\$13 gr.
Inverted Cone, Square End and Pointed Fissure		
\$1.50 doz.	\$8 half gr.	\$15 gr.

Consolidated  Dental Mfg. Co.

# NEUTRALITE INVESTMENT COMPOUND

FOR SOLDERING PURPOSES ONLY

**N**EUTRALITE can be used without moulds and without the usual loss of time for drying. There is no cracking or checking. **Neutralite** being an absolutely inert mass either under heat or cold, its remarkable advantages in soldering operations, especially in delicate work where the warping of gold would be detrimental, will appeal to all prosthetic workers. It may be subjected to any amount of heat you care to apply. **Investing, Drying and Soldering** the average case when **NEUTRALITE** is used can be accomplished in about **eight minutes**. It is a compounded material without any shrinkage or expansion under heat of blowpipe.

After the work which is to be soldered has been invested and while **Neutralite** is still wet, the blowpipe flame may be thrown around the investment without fear of cracking. When the wax is burned off the case and the investment turned white, **soldering can be done at once**, thus saving a great deal of time.

To use **Neutralite** correctly, a pinch of **Neutralite** is taken between the thumb and forefinger and the ends dipped slightly in water. These ends are packed about the article to be invested, gently but firmly until the edges are all protected and the investment sufficiently large to handle conveniently. If the first pinch of **Neutralite** is not sufficient, more **Neutralite** may be added by slightly dipping in water as stated above, at which time the blowpipe flame may be thrown about the investment until it is dry.

The price per lb. box is 50c. 10-lb. box \$4.50.

CONSOLIDATED  DENTAL MFG. CO.

# BRIDGEWORK SIMPLIFIED

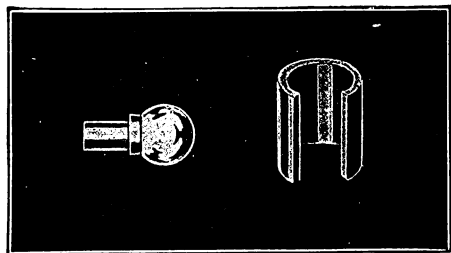
Perfect Removable Bridgework is easily accomplished with the

## Roach Attachment

(Patented)



Lower partial case (metal parts only) supplying teeth back of cuspids. The correct position of ball is shown also



SEND FOR ILLUSTRATED BOOKLET  
ASK FOR THE "ROACH BOOKLET"

CONSOLIDATED  DENTAL MFG. CO.

NEW YORK

CHICAGO

CLEVELAND

BOSTON

DETROIT

# CRESCENT STRIPS

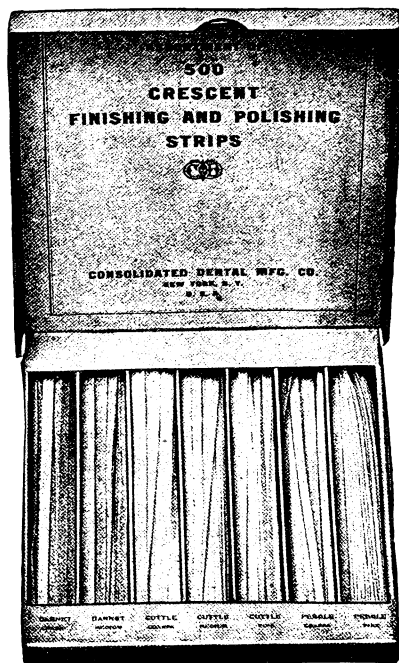
## THIN AND STRONG

Assortment  
of  
**500**

Polishing  
and  
Finishing  
Strips

The best strips at  
the lowest prices

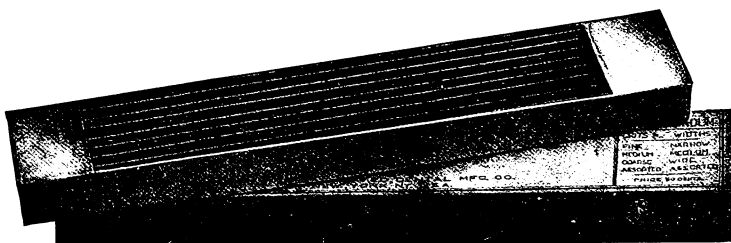
Thin and strong.  
All Linen.



Price, Assortment of 500 .....\$1.00

Grits:

Coarse  
Medium  
Fine  
Assorted



Widths:

Wide  
Medium  
Narrow  
Assorted

Price .....30c

No. 294a Crescent Polishing Strips

Crocus, Cuttle Fine, Pebble,  
Celluloid—Transparent, Enamel

No. 294b Finishing Strips

Garnet, Sand,  
Carborundum, Cuttle

SOLD BY ALL LEADING DENTAL DEALERS

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Main Office: 130 Washington Place, New York, N. Y., U. S. A.

Chicago, 29 E. Madison Street

Detroit, 801 David Whitney Bldg.

Cleveland, 499 Colonial Arc.

Boston, 120 Boylston Street

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Normal saliva is the mouth-bath and mouth-wash which nature provides for the protection of the teeth and gums. The habitual employment of alkaline dentifrices, the action of which interferes with the production or quality of this important fluid, is a procedure detrimental to oral health.

# LISTERINE

Listerine is an efficient, non-poisonous, unirritating antiseptic solution, especially adapted to the requirements of

## DENTAL PRACTICE

*To cleanse and deodorize before operating  
To wash and purify the mouth after extracting  
To treat, antiseptically, diseases of the oral cavity  
To prescribe as a detergent, prophylactic mouth-wash*

**LISTERINE** is prescribed by dental practitioners as a mouth-wash for daily use in the care of the teeth, to secure that measure of antiseptic influence which has proven so desirable in combating the acid-forming bacteria of the mouth.

**LISTERINE** because of its mildly acid reaction and aromatic flavor, stimulates the flow of normal saliva so necessary to the maintenance of a healthy condition of the oral cavity.

**LISTERINE** should be used as a mouth-wash after employing fractional chalk dentifrices, to neutralize the depressing effect exercised upon the salivary glands by these alkaline or antacid substances, and to effectually remove from the mouth all particles of these insoluble and irritating materials.

**LISTERINE** leaflet, upon the teeth and their care, suitable for distribution to patients—emphasizing the importance of frequent consultation with the dentist—supplied with dentist's card imprinted on cover in lots of 200 copies upon request.

**LAMBERT PHARMACAL COMPANY**

2101 Locust Street

St. Louis, Mo.

# WANTS. FOR SALE ETC.

NOTE.—Rate for advertising in this department of ITEMS OF INTEREST is five cents per word, including captions, "Wanted," "For Sale," "Exchange," etc., and address. Initials charged as words. Minimum charge per advertisement, \$1.00. Rate for agency advertisements is ten cents per word. Advertisements should reach us by the 15th of the month to insure insertion in the following month's issue, and are payable in advance.

CONSOLIDATED DENTAL MFG. Co., Publishers, 130 Washington Place, New York, N. Y.

Note.—Rates for ads in these columns 5c. per word. Minimum charge per ad \$1.00.

- 7143—Position wanted in dental depot by experienced tooth clerk, also familiar with merchandise and gold. Nine years' experience. Highest references. Address No. 7143, care ITEMS OF INTEREST, 130 Washington Place, New York City.
- 7144—Up-to-date office; growing American section Brooklyn; receipts exceeding \$5,000 yearly; two chairs, two electric engines, Clark apparatus, etc., \$3,000; consider half cash. Reason for selling, poor health. Address No. 7144, care ITEMS OF INTEREST, 130 Washington Place, New York City.
- 7145—WANTED—A Graduate Woman Dentist of good personality, licensed to practice in Michigan or eligible to take Michigan Board. To specialize in Oral Prophylaxis. Will send right applicant away for special instruction if experience is lacking. Pay liberal salary or give working interest. Address No. 7145, care ITEMS OF INTEREST, 130 Washington Place, New York City.
- 7146—FOR SALE—Dental Practice and Outfit in mining town in Penn. Population 7,000, no competition. Silk manufacturing plant being built employing 500. Good opportunity for young man. Price \$700.00. Address Dental Manufacturers Supply Co., 1419 Real Estate Trust Building, Phila., Pa.
- 7147—Position wanted by high-class laboratory man. Twenty years' experience in all branches of work. Best of references furnished. Address No. 7147, care ITEMS OF INTEREST, 130 Washington Place, New York City.
- 7148—WANTED—Position by first-class laboratory man both accurate and fast, capable of taking charge of laboratory.
- Dissolve partnership reason out of employment. Best of reference, will go anywhere. Address "Forward," care ITEMS OF INTEREST, 130 Washington Place, New York City.
- 7149—FOR SALE—Electric equipped outfit in Michigan town of 3,000 doing about \$3,000.00 and can be made better. Am moving to city. For particulars, address No. 7149, care ITEMS OF INTEREST, 130 Washington Place, New York City.
- 7150—"Three large light rooms, best location in Bronx, suitable for first-class dental parlor. At main transfer point. 1924 Webster Avenue. Just North of Tremont Avenue." The Dochterman Realty Co., 465 East 10th Street, City. Telephone, Orchard 4631.
- 7151—FOR SALE—Modern equipment with established practice. Oregon town of 2,500, near Portland. Ideal climate. Rich community. Address Box 868, Portland, Oregon.
- 7152—FOR SALE—Greenfield Artificial Roots. One medium sized saw, two artificial roots, two root facers, two drills and two gum cutters. All of the latest type and never been used. Address "E. C. S." care ITEMS OF INTEREST, 130 Washington Place, New York City.
- 7153—WANTED—A man capable of managing a dental laboratory. Man must be an extra good plate worker, and be able to also do good crown and bridgework. Must be sober and have first-class reference. Address Noa Spears Co., San Antonio, Texas.
- 7154—FOR SALE—Fully equipped dental office and about \$4,000 practice in live

(See following page)

**E. R. S. BREWSTER**  
**GOLD and SILVER REFINER—ASSAYER—SWEEP SMELTER**  
MANUFACTURER OF  
**Brewster's Famous New "Formula" Gold Solders and Gold Plates**  
**CHICAGO, ILL.**

## WANTS, FOR SALE, ETC.

New Hampshire city. Owner deceased. Address Mrs. L. Cose, Laconia, New Hampshire.

7155—FOR SALE—Well equipped dental office located in one of the very best sections of Cleveland; established ten years; good steady practice which can be increased by any capable young dentist giving all his time to the business. Reason for selling, retiring from dental practice. Address No. 7155, care Consolidated Dental Mfg. Co., Cleveland, Ohio.

7156—We have a permanent position for a good dentist. Couvrette & Colborn, Grand Forks, North Dakota.

7157—WANTED—A good all-round man registered in Connecticut. Advertising office. Give experience and references. Address "Conn." care ITEMS OF INTEREST, 130 Washington Place, New York City.

7158—FOR SALE—Modern ten room brick house, seven acres of land on river and dental practice, Northern New York, \$3,500.00. Good for summer home. Address W. L. Walling, Champlain, New York.

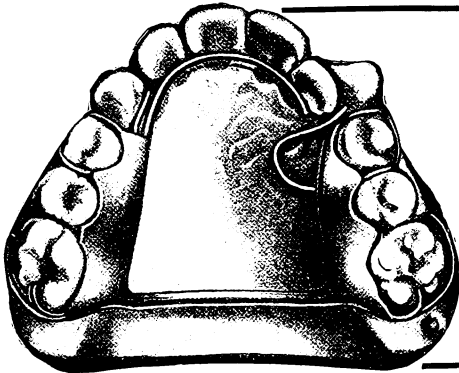
7159—FOR SALE—Full line of Dental Instruments, also Furniture of the late Dr. Brown. Address, Mrs. J. K. Brown, 508 King St., Wilmington, Del.

## Course in Conductive and Infiltration Anaesthesia

Names of those having taken the course furnished upon application.

*For further information,  
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**E. A. SCHRADER**  
Independence, Iowa



**Chester T. Sweet**  
**JACKSON'S**  
**ORTHODONTIC SPECIALTIES**

Seven years with Dr. Jackson

Each appliance \$7.00

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## "KELENE"

(PURE CHLORIDE OF ETHYL)

*also as adjuvant to  
Ether and Chloroform in*

## GENERAL ANAESTHESIA

**WHY** IS IT THE BEST, SAFEST, MOST EFFECTIVE,  
HARMLESS AND MOST EASILY ADMINISTERED?

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**FRIES BROS., Manufacturers, 92 Reade Street, N. Y.**

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*The beautiful Art of filling teeth with Porcelain and the application of the Porcelain Jacket Crown are doing more than anything else to dignify the practice of Operative Dentistry.*

THESE LABORATORIES SPECIALIZE IN DENTAL CERAMIC ART FOR ANY DENTIST, ANYWHERE AND GUARANTEE ACCURACY OF ADAPTATION AND HARMONIOUS BLENDING

*Information* for the dentist wishing to use these Laboratories is best made known to the profession through our illustrated literature, a complete set of which will be sent free on request.

*These Laboratories* are manufacturers of complete equipment for the porcelain and gold inlay worker. We use and recommend the materials and apparatus shown in our catalogue with which the distinctive character of our Laboratory results is made possible. Catalogue sent free on request.

## The Lochhead Laboratories, Inc.

109 West 42nd Street

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NEW YORK CITY

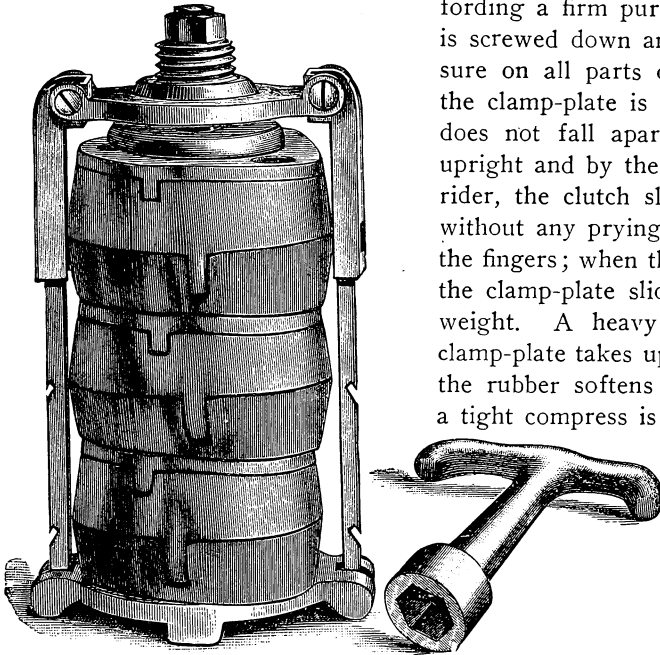
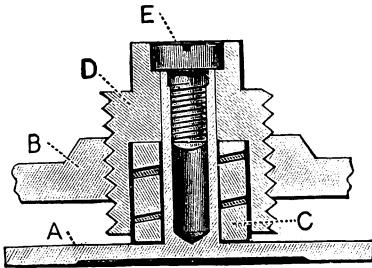
Suite 1739-41 Marshall Field Annex Bldg.

BOSTON

120 Boylston Street

# The Consolidated Donham Flask-Press

(Patented Jan. 27, 1907)



The illustration shows how this flask-press can be adjusted to take either one, two or three flasks. Pieces of pipe heretofore required on the rigid frame Donham Flask-Press are dispensed with. The clamp-plate slides up and down on the frame bars; a clutch in the rider grips the notches in the frame bars, affording a firm purchase when the plate is screwed down and insures even pressure on all parts of the flasks. When the clamp-plate is unscrewed the frame does not fall apart. The bars remain upright and by the hinged action of the rider, the clutch slips out of the notch without any prying or handling to burn the fingers; when the flasks are removed the clamp-plate slides down by its own weight. A heavy spring "C" in the clamp-plate takes up the shrinkage when the rubber softens in the flasks. Thus a tight compress is insured even though

the cases and flasks shrink to the improbable extent of one-quarter of an inch. The clamp-plate, riders and spring are made of bronze. All the

other parts are of solid brass—nickel dipped. A long hook for lifting it from the vulcanizer is furnished with each press. This press is simple, strong, of very small bulk and unusually easy to adjust.

**Price complete, without Flasks, \$3.50**

FOR SALE AT ALL LEADING DENTAL DEPOTS

**CONSOLIDATED  DENTAL MFG. CO.**  
**NEW YORK**

REPORTS **FROM** OUR  
 PACIFIC **COAST** AGENTS  
 LEAD US **TO** EXPECT MORE  
 ATLANTIC **COAST** ENTHUSIASM

relative to the closed mouth impression method  
 as originated and demonstrated by  
 SAML. G. SUPPLEE.

It looks as though the old hit or miss plaster  
 scheme would soon be a thing of the past. Big  
 orders for Supplee compound heating outfits and  
 impression trays are very tangible evidence.

*Write for information to*

**SAML. G. SUPPLEE & CO.**

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**SAFETY FIRST  
PERFECT INSULATION**  
*Smallest Power Motor in the World*

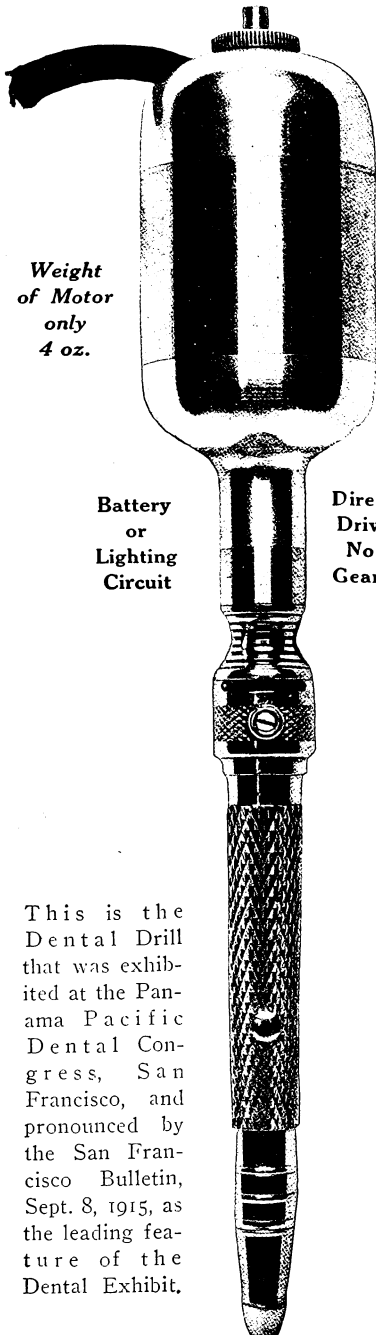
# Latest Electric Dental Drill

**Result of Over 20 Years'  
Research and Experimenting**  
**6-250 Volts. A. C. or D. C.**

**Weight  
of Motor  
only  
4 oz.**

**Battery  
or  
Lighting  
Circuit**

**Direct  
Drive  
No  
Gears**



This is the Dental Drill that was exhibited at the Panama Pacific Dental Congress, San Francisco, and pronounced by the San Francisco Bulletin, Sept. 8, 1915, as the leading feature of the Dental Exhibit.

Before again mentioning the merits of the miniature Dental Electric Engine we wish to thank the readers of ITEMS OF INTEREST for the large number of letters we have received from them in response to our advertisement in the recent issues and to further thank them for their patience while waiting for our belated acknowledgment of their letters. We are increasing our clerical force and will be able to answer promptly letters the day they are received.

The cut shows actual size of a complete Dental Engine.

It is perfectly balanced and is powerful enough to drive  $\frac{1}{2}$ -inch grind stone on first speed and larger diameter on the three higher speeds.

It is a direct drive. No gearing down devices to give power. One revolution of armature to one revolution of the drill. Power is obtained directly from the current.

Each motor will operate on either alternating or direct current.

It is regulated by the usual office foot controller giving four speeds 600-2800 R. P. M. forward and reverse.

It is also regulated by a small, very light portable controller that may be placed in a case along with the engine, instrument, medicine, etc., and taken to the patient's home or hospital and by removing a lamp from a socket you can regulate the motor to give the same four speeds forward and reverse and to deliver the same power.

It is noiseless and stands for maximum efficiency.

The light telephone cord attached to the motor affords the operator absolute freedom of movement. The change of handpieces is accomplished by unscrewing one from the motor stem and screwing in the other, requiring about the same time as the slip joint. The motor takes any hand piece that has the same thread as No. 7. Only the Doriot Handpiece requires fitting in our factory. The No. 6.-No. 7 Contra Angle, Fellowship, Consolidated or Engine Mallet may be screwed into the motor and be ready for operating in a few seconds. Or new handpieces may be ordered with the engine.

It is built by the Westinghouse Company and the outfit is offered the profession after having been subjected to hard usage in actual practice in New York. It is guaranteed for one year against defect not caused by misuse, abuse or accident.

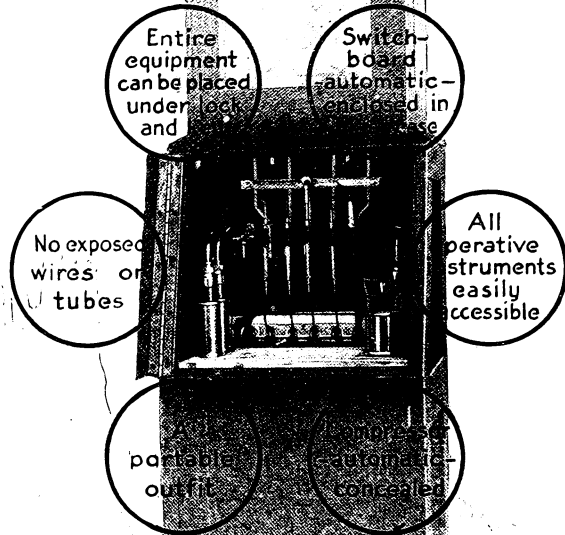
Send to-day for free Catalogue and acquaint yourself with an Engine that will increase your earning capacity in your office and in call cases of emergency.

**Miniature Electric Dental Engine**  
**H. A. WHITESIDE**

**24 East 48th Street**

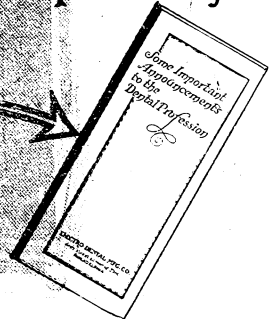
**New York City**

# The Electro Dental Cabinet Unit



**Comes to you complete—**  
No expense for wiring or plumbing.

We recently mailed a copy of this pamphlet to every dentist in the United States and Canada. If you did not receive your copy write to us and we will send you another.



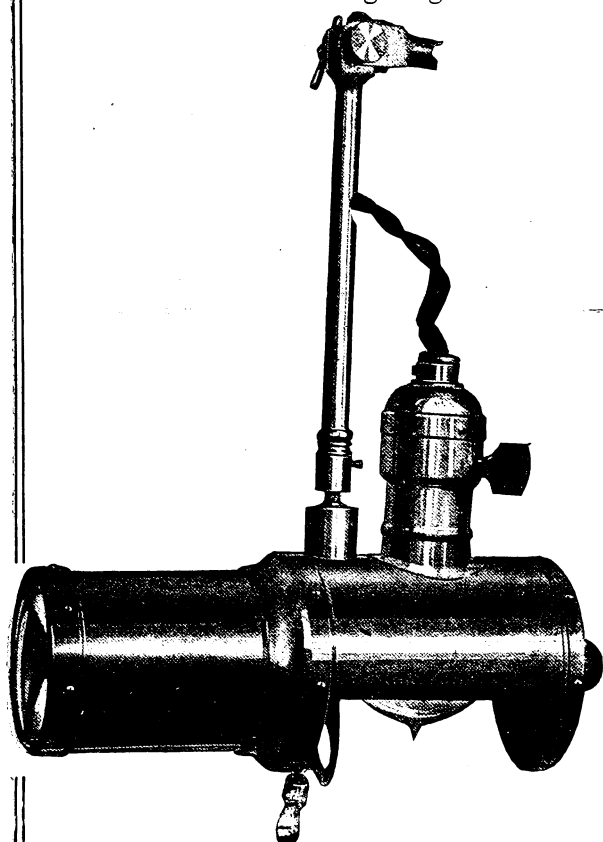
**ELECTRO DENTAL MFG. CO.**

3261 Arch Street

Philadelphia, Pa.

# THE 1915 LEWIS ILLUMINATOR

is the result of extensive experimenting to produce a simple, practical and effective means of lighting the mouth.



Patented { May 3, 1904  
Dec. 20, 1910

The price of the 1915 Lewis Illuminator with Mazda Lamp, 105 to 125 Volt, or 220 to 250 Volt, is \$12.00. Without lamp, to take any lamp you may select, \$11.50. Bracket, \$3.70 extra.

Whether you need a Mouth Illuminator or not you will be interested in Booklet No. 2, on Electric Mouth Illumination. Ask for it.

THE BODY OF THE ILLUMINATOR is made in two diameters; the one enclosing the lamp being three inches, enlarged to  $3\frac{3}{8}$  inches at the center, and the smaller forming the condensing chamber, being  $2\frac{1}{2}$  inches in diameter. These sections are firmly riveted together and secure the diaphragm that separates the sections. This diaphragm, besides excluding the direct heat from the lamp, is quite an important member, as to it is attached on one side the condensing lens by a suitable bezel, and to the other side the bracket on which is secured the shutter.

THE SHUTTER enables the operator to control a circle of light of four diameters, ranging from two to six inches, by moving the small handle projecting from below to either right or left to a stop. It is conceded that controlling the diameter of the light is of as much importance as the proper focusing.

The Illuminator is suspended from the bracket by means of a depending arm, on the lower end of which is a ball and socket joint which gives it a great range in any direction. At the rear of the casing is a wood handle, protected from the heat by a fibre washer, for changing the direction of the Illuminator. It will be observed that there is no occasion to place the hand on the metal parts of the Illuminator either for changing the direction of its rays or for obtaining the different sizes of the rays.

## Buffalo Dental Manufacturing Company

BUFFALO, N. Y., U. S. A.

# Aseptic Absorbent Points

(Johnson & Johnson)

## Surgically Clean

### For Drying Pulp Canals

The observance of the rules of true asepsis in pulp canal operations as now recognized and practiced by many leading dentists of this country, necessitates the use of surgically clean absorbent materials for the drying of pulp canals. A marked departure from some of the old methods is imperative. Loose cotton (that was once aseptic) wrapped upon a broach under ordinary conditions, with the fingers will not do.

To attain any degree of certainty in the successful treatment of pulpless teeth, the general rules of aseptic surgery must be observed. Absorbent Points are surgically clean. They are to be handled with sterilized instruments only. The fine even taper and wire-like quality of these points admits them to canals inaccessible to any other form of absorbent.

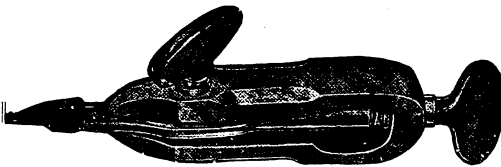
Put up 200 in box, each box in four aseptic compartments.....per box, 50 cents

Sold by leading Dealers in Dental Supplies  
in every country in the world.

Specify Johnson & Johnson's

JOHNSON & JOHNSON,

New Brunswick, N. J., U. S. A.



## A Dentist's time represents a considerable amount of money

Every dentist whether he is busy during all of his office hours or not, is necessarily wasting time by doing dental work with tools that are slow and crude.

### THE "LITTLE GIANT" POST PULLER

is the most efficient little instrument for extracting broken off crown pins or posts. It does the work in *less than 3 minutes* and not only saves unnecessary labor and time on the dentist's part, but does away with pain to the patient or the possibility of splitting the root.

The price of only \$3.00 is another big feature that should not be overlooked. If you are not yet equipped with a "Little Giant" don't hesitate to get it at once. It is an investment that you will never regret. Your supply dealer has it.

When thinking of a "Little Giant" remember Kuroris a most serviceable device for massaging the mucous membrane of the gums, cheeks and tongue. Your supply dealer has it.

**F. H. SKINNER**

**25 E. Washington St., Chicago**

COLUMBIA

CONFIDENCE is the embodiment of experience and is the result of long continued dependability, service, and satisfaction.

Columbia product gives maximum service with minimum attention. It has served the profession for thirty odd years in practically every part of the world with the result that the name COLUMBIA on dental equipment is generally accepted as being a guarantee of absolute satisfaction and continued good service.

Ideal Columbia Chairs, Columbia Electric Engines, Lathes, Air Compressors and Distributing Panels are as modern in design and as practical in operation as more than a quarter of a century of experience, skill and a model factory can make them, and yet the prices are moderate.

Catalogs describing Columbia product can be obtained gratis of your dental supply depot or same will be sent direct upon request and your dealer's name.

THE RITTER DENTAL MFG. CO.

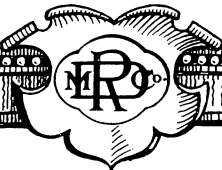
ROCHESTER, N. Y., U. S. A.

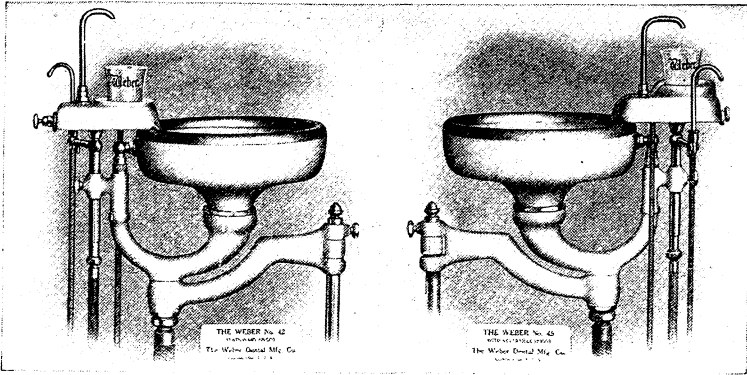
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No. 42

No. 45

## The Most Beautiful and Substantial Cuspidors Made

*Recent new Features Patented:*

GLASS VALVE SHIELD  
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UNLEAKABLE SALIVA EJECTOR  
NEW SALIVA EJECTOR HOLDER

*WEBER CUSPIDORS are GUARANTEED to please  
and satisfy, or money refunded*

THE WEBER DENTAL M'F'G. CO.  
CANTON, OHIO

*Write for our new 1915 Catalogue and terms of Exchange Proposition*

# Dioxogen

**P**ERHAPS the most valuable germicide available for oral use; more effective than any Carbolic or Bichloride solution that is safe to use, but free from objectionable properties of every kind, it is scientifically and practically of value to dentists.

**DIOXOGEN** combines vigorous cleansing qualities with germicidal efficiency, and while free from odor is itself a powerful deodorant; as a styptic it is unexcelled.

**DIOXOGEN** is a Peroxide with the "ifs" eliminated 99<sup>961</sup>/<sub>1000</sub>% pure.

Sample will be gladly sent on request.

**THE OAKLAND CHEMICAL CO.**

10 Astor Place, New York.



## Kerr Blue Inlay Casting Wax

- ☐ A wax that softens easily over flame or in water. ☐ Burns out leaving no residue.
- ☐ Carves easily and can be built onto. ☐ The color being distinctive it shows the thinnest margins very plainly while carving in the mouth. ☐ A wax that holds its heat thereby giving the operator time to manipulate and burnish to the margins.
- ☐ Softening over flame is much preferred to softening in water.

Price . . . . . Per box, 50c.

## Kerr Graphite Inlay Investment Compound

FOR CAST INLAY WORK

- ☐ A scientifically prepared refractory compound that will not disintegrate or crack under the severest heat and permits casting in a hot expanded mould, thereby helping to compensate for considerable contraction in cast gold inlays. ☐ This compound, although containing graphite, is so prepared that it will mix readily with water.

Price, 1 lb. can 50c.      3 lb. can \$1.00      10 lb. can \$3.00



## Kerr Graphite Soldering Investment Compound

FOR CROWN AND BRIDGEWORK

- ☐ A scientifically prepared refractory compound that will not disintegrate or crack under the severest heat. ☐ An expanding investment compound, a property that will be found of utmost value in compensating for the contraction of the solder in cooling.

Price, 3 lb. can \$1.00      10 lb. can \$3.00

Ask for Circular G 4-5

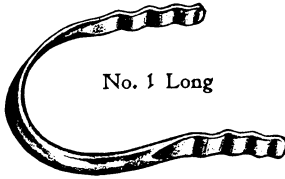
Ask Your Dealer

**DETROIT DENTAL MFG. CO.,**

**Detroit, Mich., U.S. A.**

Something New! Something Different!! Something Better!!!

# Jelenko's Ready-Shaped Lingual Bars



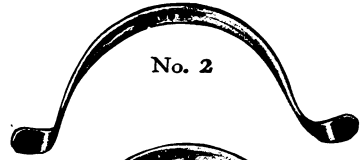
No. 1 Long

This illustration (actual size) shows the new angle and corrugated ends. Also made in No. 1 Medium (1 inch long) and No. 1 Short ( $\frac{3}{4}$  inch long). Special Lingual Bar Wire furnished at 50c. dwt. or \$8.00 oz.

Jelenko's Ready-Shaped Lingual Bars are HEAVILY cased (not plated) with 18 kt. gold. The center is of a HIGH-FUSING metal and the casing is heavy enough to obviate all fear of wearing off. These bars can be used to take the place of solid gold bars as they will out-last the life of any rubber plate.

**\$1.25 Each**  
**\$12.00 Dozen**

ORDER BY NUMBER



No. 2



No. 3



No. 4

*This Illustration shows exact size, style and the NEW angle and ridge.*

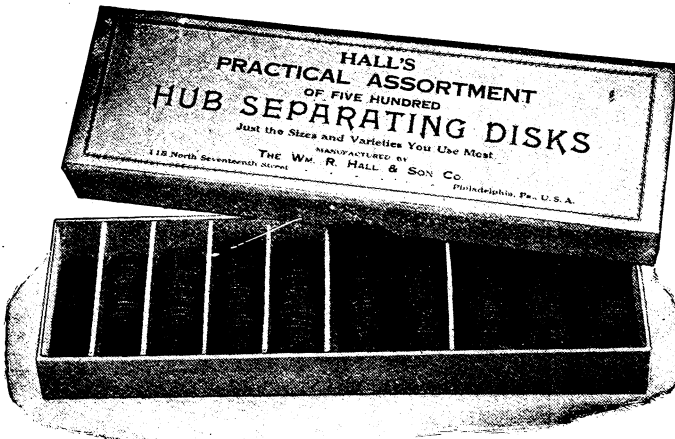
ON SALE AT ALL DENTAL DEPOTS  
OR DIRECT FROM THE MANUFACTURERS

## J. F. JELENKO & CO.

1 UNION SQUARE

Manufacturers of Dental Gold

NEW YORK, U. S. A.



# 500 Assorted SEPARATING DISKS

We have combined in this dispensing box, 500 of the most needed sizes and varieties of Hub Separating Disks in every day use, viz., Double Sided, Safe Sided, Flat and Concave, in Sizes  $\frac{5}{8}$ ,  $\frac{3}{4}$ ,  $\frac{7}{8}$  inch.

The box has compartments for each size and style of disk, so that it may be seen at a glance. The box is of a convenient shape to place upon your instrument table, taking up very little space.

By buying the combination box you save 20% over purchasing disks in separate lots and always have at hand the disk you need.

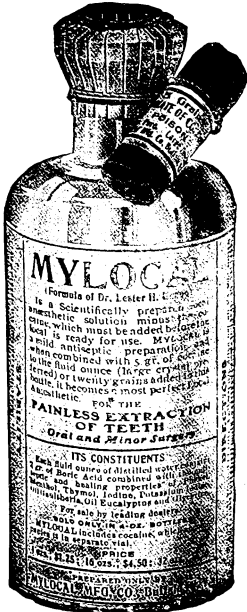
**Price per box, \$5.00**

## THE WM. R. HALL & SON CO.

918 NORTH 17th STREET,

PHILADELPHIA, PA.

## A Few of Many Good Reasons Why You Should Use MYLOCAL



### THE STANDARD ANAESTHETIC OF THE DENTAL WORLD

- 1—**Because** You are in duty bound to protect your patients and yourself and are justly entitled to *definite knowledge* of the quantity and quality of cocaine employed in your anaesthetic.
- 2—**Because** The courts hold that you are presumed to have *reasonable knowledge* of the strength and nature of all medicines and preparations employed in your practice.
- 3—**Because** All users of **Mylocal** may test, weigh, inspect and add the cocaine themselves. This means *definite knowledge* and implies *safety*.
- 4—**Because** The users of "ready made" solutions have no definite knowledge and no means to determine the quantity and quality of cocaine placed in the solution. This means an element of chance and they take the *risk*.
- 5—**Because** Cocaine in aqueous solution decomposes with age. This is a scientific fact which it is futile to question. Standard text books say so, and dentists know it.
- 6—**Because** it has been used for over a decade in practically every civilized country in the world, in millions of cases, and we have yet to record the first serious complaint as the result of its use.
- 7—**Because** it is sold at a most reasonable figure, notwithstanding the slight advance made necessary by war conditions, and our large and increasing sales permit us to give you the highest possible quality at the lowest price.

4 ozs., \$1.50      24 ozs., \$8.25      48 ozs., \$15.75      96 ozs., \$30.00

**THE MYLOCAL MFG. COMPANY** 300-302 Main St. BUFFALO, N. Y.

## POND'S EXTRACT COMPANY'S TOOTH PASTE

Prepared by an entirely new process, producing a hitherto unobtainable smoothness.  
Antiseptic, germicidal and agreeable in taste.      ¶ We state with confidence that it is

### THE LAST WORD IN ORAL PROPHYLAXIS.

We will send you one of our "Physician's Packages" containing a *regulation tube* and a *quantity of samples*. We will be glad to have you compare this with any other Tooth Paste on the Market. Won't you send us your name and address?

POND'S EXTRACT CO.

131 Hudson Street, New York

Department 1

## BEFORE and AFTER



BEFORE INSERTING



AFTER INSERTING

Denture is inserted in mouth; no place to fill up with soft tissue and become irritated as in the old worn-out methods.

Thousands of Dentures are in daily use with the "EUREKA" attached that could never wear a plate before.

### CAN YOU AFFORD TO TAKE CHANCES?

Price: \$2.00 per box—half doz.

**EUREKA SUCTION CO., Loudonville, Ohio**

# The PELTON and CRANE CO. Type "Six 41" COMPRESSOR LATHE UNIT

A perfect combination of a substantial Air Compressor and a practical Dental Lathe.

It is economical in operation as air can be compressed at the same time that the Lathe is being used for polishing, etc.

It is fitted with an attachment which disconnects the belt to pump and allows the Lathe to be operated separately.

The Lathe Motor is full one-eighth ( $\frac{1}{8}$ ) horse-power (approximately twice as strong as any standard Dental Lathe) which guarantees satisfaction in connection with this service.

The shaft of this Lathe revolves at 1750 revolutions per minute and the polishing end is tapered to accept regular Dental chucks.

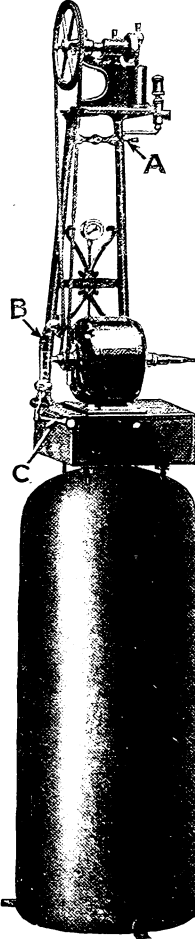
The Compressor Pump used with this outfit is our Standard No. 41 Wall Type Pump.

## PRICES

Type "Six-41" A.C. 110 volts.....	\$ 95.00
Type "Six-41" A.C. 220 volts.....	100.00
Type "Six-41" D.C. 110 volts.....	80.00
Type "Six-41" D.C. 220 volts.....	85.00

The above prices are for the outfit exactly as shown.

When fitted with No. 42 Pump, outfit is known as the Type "Six-42" and lists \$15.00 extra.



If desired we can use the No. 42 Wall Type Pump with Automatic feature. (See prices below).

The entire outfit is beautifully finished in black enamel—gold striped—and highly polished nickel-plate affording an exceptionally attractive appearance.

As shown stands 75 inches in height—40 inches to Lathe Platform. The base is less than 15 inches in diameter.

The enameled Seamless Steel Tank is 36 inches high by 14 inches in diameter. Capacity 18 gallons.

A nickel-plated Gauge placed directly above the motor registers the amount of air pressure in tank.

The air outlet is arranged for two connections—one to the Operating Rooms and one for the Laboratory.

## PRICES

Can be had less Tank (to mount directly on bench) at \$17.50 less than prices quoted opposite.

Complete outfit as shown but less Motor .....\$55.00

When ordering be sure to state voltage and if alternating mention cycles of current.

Prices do not include Chucks.

Send for Complete Catalogue "ELECTRIC EQUIPMENT" Free on Request

**The Pelton and**  
244-256 HARPER AVE.



**Crane Company**  
DETROIT, MICH.

# The Prevention of Dental Decay

calls for careful attention to the eliminative functions, since it has been definitely shown that the accumulation in the system of the poisons produced by intestinal putrefaction leads to all manner of dental disease. For securing bowel regulations and thorough intestinal elimination, there is nothing that the dentist can employ with such complete satisfaction as

## Prunoids

(Edible Tablets)

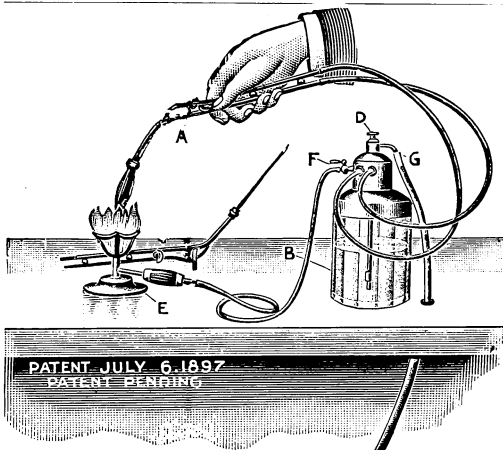
This noteworthy preparation is not only surprisingly effective in its capacity for stimulating bowel activity, but it is remarkably free from all disagreeable after-effects such as griping, reactionary constipation, or tendency toward hemorrhoids. In fact, its whole action is physiological, since it produces its effects solely through stimulating the natural intestinal processes.

Clinical experience has demonstrated conclusively that Prunoids are especially serviceable to the dentist in his efforts to restore and maintain hygienic conditions of the body.

*Samples on request*

*For sale by all druggists*

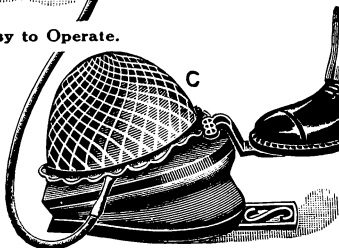
**THE SULTAN DRUG CO.**  
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Simple—Economical—Easy to Operate.

### THE BELLOWS

is made from the best material obtainable, is of ample size and durable construction.



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Improved Safety for Gasoline.

Scientifically Constructed.

Produces either a **HEAVY** brush flame or the **FINEST** needle-point.

**THE FLAME** is exceedingly clean, intensely hot, perfectly safe, and absolutely non-blow-out.

By adjusting the thumb-valve any size of flame may be obtained, and instantly changed if desired.

### This GENERATOR

HAS A HEAVY GLASS BASE; THE REMAINING PARTS ARE OF BRASS HEAVILY NICKEL-PLATED.

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Outfit, Complete . . \$15.00  
Outfit, without Bellows 10.50  
No. 9 Foot-Bellows only—C 4.50

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**Analgesic-Sedative**

**TO BE USED**

After exposure of pulp  
For Insomnia

Due to pain from irritation of dental nerves

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Periostitis

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**Prof. Fischer's N. S. Tablets "E"**

For 2% Solution

**Prof. Fischer's Modified Ringer  
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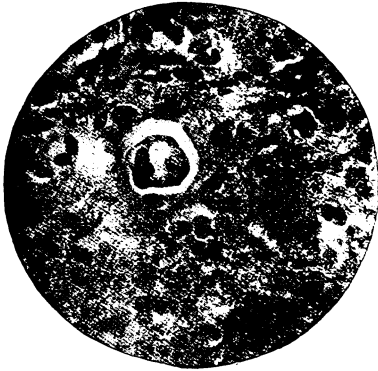


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PYORRHEA. Showing Amoeba, Bacteria and Pus Cells

**An ounce of prevention  
is worth a pound of cure**

*The disease*  
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**Oretine Tooth Paste**

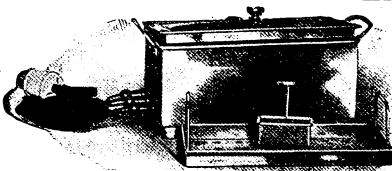
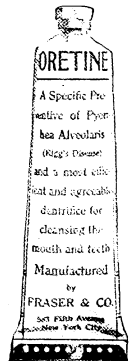
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**The Prometheus Electric Sterilizer**  
NOW HAS A PROTECTIVE DEVICE  
NO RUNNING DRY. 5 YEAR GUARANTEE.  
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**AIDS**

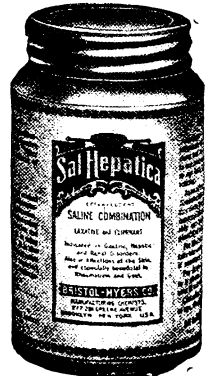
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**PYORRHEA**

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**MILLIONS**  
OF SUCCESSFUL OPERATIONS  
PERFORMED WITH THE AID OF  
**DR. R. B. WAITE'S**  
**Antiseptic Local Anaesthetic**  
WITH COCAINE  
PROVE IT TO BE  
**THE PERFECT LOCAL ANAESTHETIC**



**THERE HAS NEVER BEEN A DEATH FROM ITS USE**

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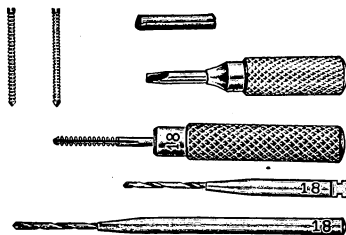
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Anterior Teeth with Screw Wire Posts in Position for Plastic Porcelain Restoration.



Plastic Porcelain Restoration of Anterior Teeth Completed.



Box containing one dozen Screw Wire Posts of one gauge, Blue Island Brand non-corrosive metal, gold color, slotted and pointed, heavy gold plated, with screwdriver, 2 drills and 1 tap ..... \$2.50  
Drills, each..... .30  
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Screw Wire Post, ½ inch long..... .10

Precious metal prices on application.—  
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CARE AND TREATMENT WILL PRESERVE THE TEETH AT ALL AGES

AN IDEAL DAILY MOUTH WASH,—  
PREVENTS FORMATION  
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WHICH IS A  
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IN CAUSING DECAY  
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That's what this preparation is. You should add it to your medicines.

### WHY

#### BECAUSE

It is more effective than any preparation of its kind that has been offered to the dental profession.

#### BECAUSE

The gratifying results which are obtained in a few treatments.

#### BECAUSE

It stimulates and in nature's way revitalizes, regenerates and restores all tissues to a healthy condition.

#### BECAUSE

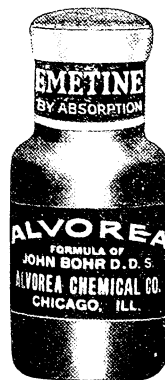
It contains Emetine and is a safe method of administering Emetine Hydrochloride. It is effective, sure and safe.

**Alvorea** (Liquid) is a pyorrhea astringent containing Emetine and acts by absorption when applied locally, penetrates tissues, destroys pus, dissolves infiltrations, also deposits in the tissues. It is an Effective Stimulus to morbid tissues.

**Send for booklet on Pyorrhea**

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Sold on a result basis. If the first bottle does not produce **unusual results**, return it and you will receive credit. We are confident of results. That's why we make this offer.



Trial size bottles at \$1.00  
Small size bottles at 3.00  
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**Now carried in stock by best Dental Depots**

## Alvorea Chemical Company

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# Salvitae

## The Eminence of Its Advocates

The eminence of its advocates is unassailable proof of the incomparable value of Salvitae in the treatment of pyorrhea alveolaris, gingivitis and other dental affections of constitutional origin.

SALVITAE has the unqualified indorsement of those who have achieved world-wide distinction in dental science. In the most positive terms, these men advocate the employment of the preparation in the treatment of pyorrhea alveolaris, gingivitis and other dental disorders arising from uratic deposits in or about the alveoli.

## Salvitae

SALVITAE excels other uric-solvents and eliminants, in that its action is decidedly more prompt, agreeable and uniform. Moreover, its prolonged administration does not give rise to gastric or intestinal disturbance.

SALVITAE is an effervescent salt of delightful flavor. The dose is from one to four teaspoonfuls, in a glassful of water, three or four times daily.

Samples and a booklet embracing the opinions of the most eminent members of the dental profession sent on request.

AMERICAN APOTHECARIES COMPANY, ASTORIA, GREATER NEW YORK



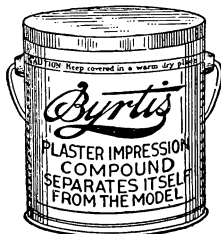
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Separates itself from the model on introduction into boiling or simmering water. A trial will convince you that it is the best mechanical assistant you have ever known, always on time, no excuses, no broken models or crown abutments. A faithful laboratory man not drawing salary — a practice builder. Have you tried Byrtis? We want you to.

### Liberal Sample 10c.

*Simply send your letterhead or card.*

BYRTIS Plaster Impression Compound put up in four sizes: 2-lb. cans \$0.65; 5-lb. pails \$1.25; 10-lb. pails \$2.00; 30-lb. pails \$4.00; 65-lb. bbl. \$7.00.



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YOUR duty to humanity is to see that YOUR patients know how to keep the teeth and mouth absolutely clean.

The brush is far more important than the dentifrice.

## The Rolling Tooth Brush

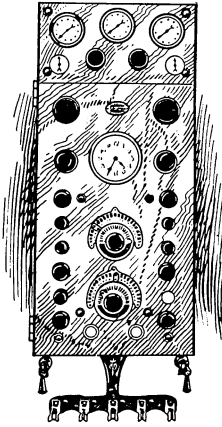
has the endorsement of every intelligent dentist.

Supply yourself and patients. Urge your druggist to stock them. Samples 25c postpaid.

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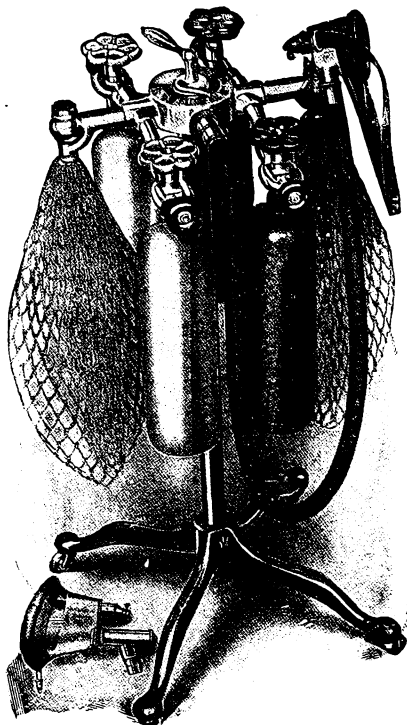
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MR Co.



Clark New Model Gas Apparatus  
(The Outfit that Popularized Analgesia)

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\$40.00 act like \$65.00,  
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A Spittoon of Excellent  
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Our New Catalog is full of  
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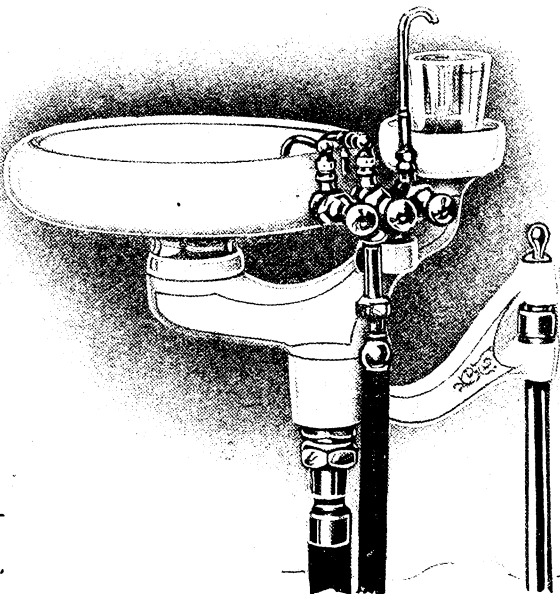
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I am only a novice at it yet, but even then, the results are wonderful. No trouble, no accidents, better work. So much for that.

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CLARK -40- SINGLE

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*This Automatic Brace* is designed for all surgical work of the mouth and throat.

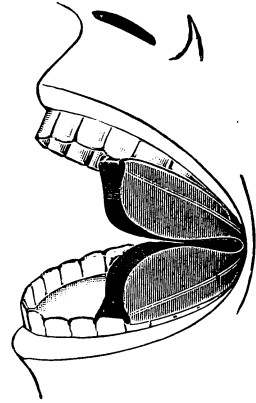
There is ample room for operator; not at all in the way.

Absolute comfort to patient, and can be easily and quickly adjusted though the teeth be missing, it conforms to, and fits any mouth.

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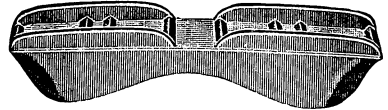
*The Brace that Controls the Kid.* Highly recommended by leading Exodontists, Physicians and Hospitals.



Patented in Europe and America

**TWO SIZES, 75c. EACH**

Order Direct or from Dental and Surgical Dealers



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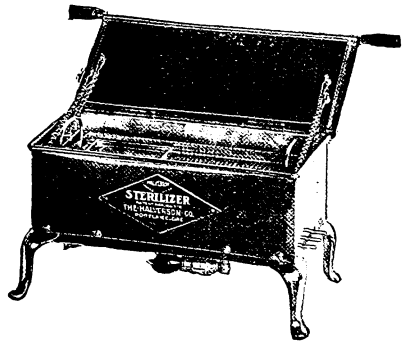
A scientifically prepared compound that will not disintegrate or crack under the severest heat.

Moderately quick-setting, smooth texture, non-shrinkable, high-fusing investment compound, prepared especially for Gold Inlays.

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LAKE AND CLINTON STREETS  
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Has an *automatic lifting tray*, reliable heating element, *automatic protecting plug*, *safety fuse screw*, solid bronze rubber tipped legs, heavy copper body, and *red signal light* on the bottom, a silent reminder the current is on.

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“The writer does not think the X-ray proposition either difficult to master, expensive to operate or equip. While the whole dental profession seems to be chasing this new fad to the limit at the present time, there is undoubtedly a well defined place for an X-ray apparatus in every well regulated dental office. We are glad this is so, and we dentists are to have a good excuse for owning and making the successful operation of such apparatus a part of our practice. The general public certainly look on the medical man who stands behind this machine as some wizard and come forward with their \$5 per, so easy, it is a shame to take the money.”

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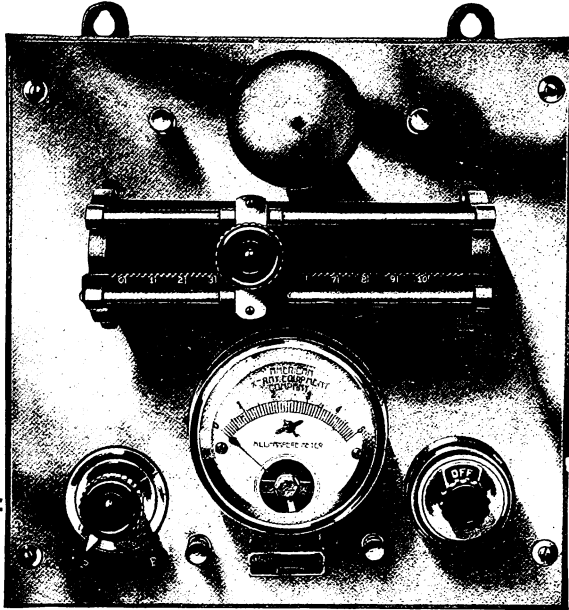
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High Frequency current produces ultra violet rays when connected to a vacuum electrode. This furnishes a means of applying locally this valuable agent, which is an adjunct in the treatment of many oral lesions. The High Frequency current can also be used as a diagnostic agent in determining whether a tooth is devitalized or not.

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Pustolene will cure that stubborn abscess in one or two treatments if you will give it a chance. Pustolene is essential with thousands of dentists. Why? Because it does the business, and that's what you're looking for.

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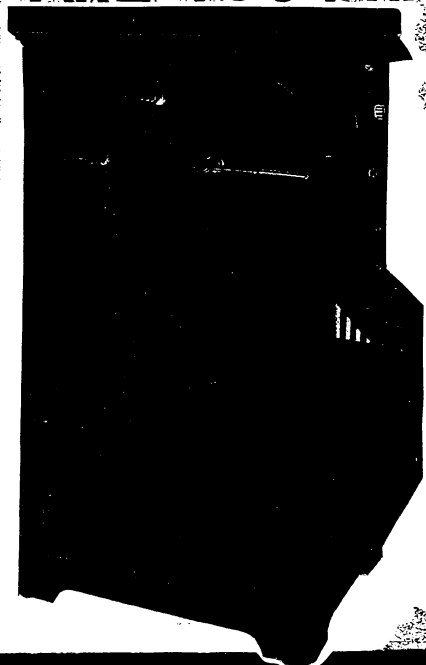


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An investment every progressive  
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The Waugh Radiographic Unit has no **moving** parts, requires no oiling, and is about the **simplest** part of a dental equipment. The parts are few in number, rugged, and accessible.

To make an exposure, swing the X-Ray bulb into position, place one of the small dental films in the patient's mouth, and press the **floor switch** for a second or two.

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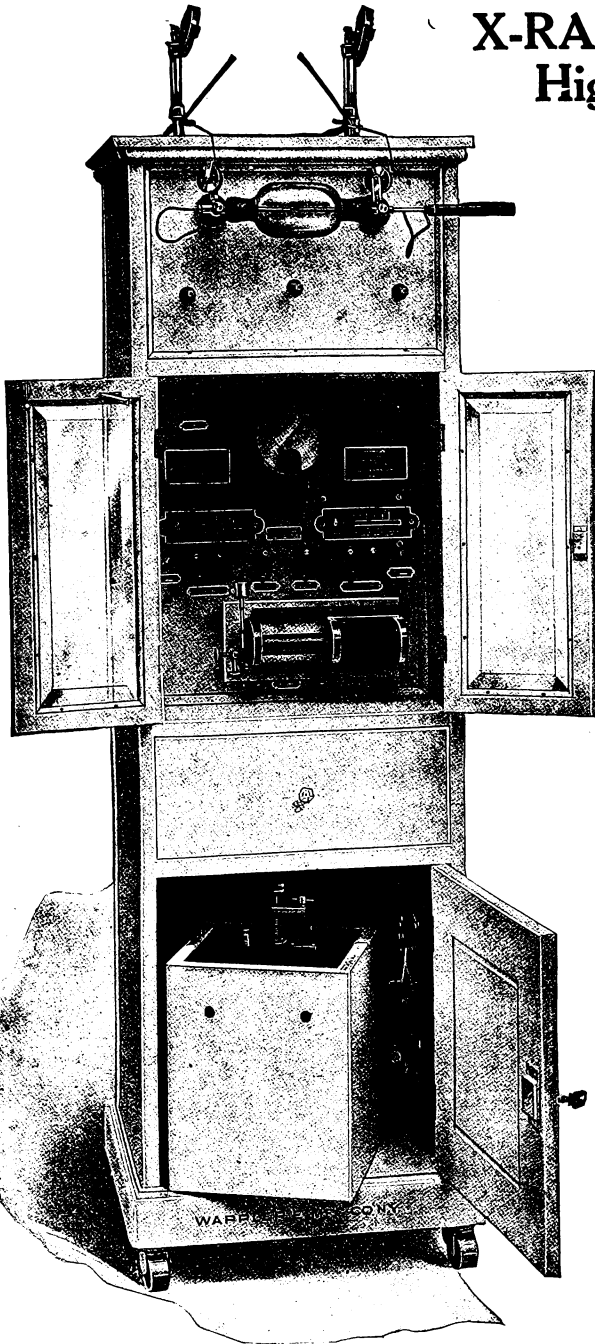
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Combination X-Ray, High Frequency and Cataphoresis Machine

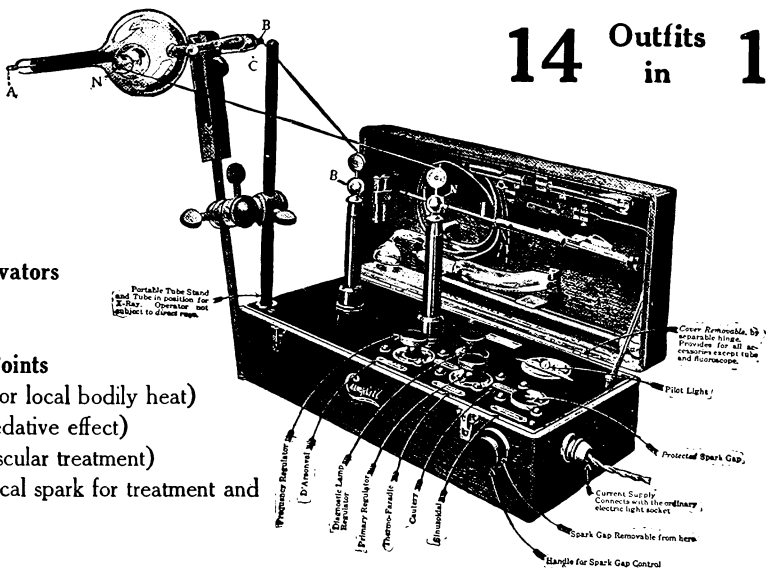


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Will give currents  
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**HEALTH — WEALTH — HAPPINESS**

**HEALTH** for your patients that they can never enjoy with the present-day, unsanitary, fixed or removable bridgework.

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**HAPPINESS** for *both* of you in the ideal, satisfying results obtained by the use of the "Chayes Parallelometer, Parallelodrill and resilient Bucco-lingual attachments."

These bucco-lingual attachments are ideal for use in removable bridge-work, for they not only provide a strong, sturdy means of anchorage but they also assist Nature in that they allow a limited motion to the bridge under stress of mastication in every direction, vertically, bucco-lingually, linguo buccally and to a less degree mesio-distally; thus providing a slight constant massage to the underlying mucosa so necessary to its health. Where there is no pulp involvement it is not necessary to devitalize the teeth to be used as piers or abutments and then too, the natural diameter and contour of these teeth may be preserved. Following the Chayes method and using the Chayes instruments in paralleling these Bucco-lingual attachments, you may be sure of absolutely perfect results; results which will give your patients increased **HEALTH** and yourself increased **WEALTH** and *both* increased **HAPPINESS**.

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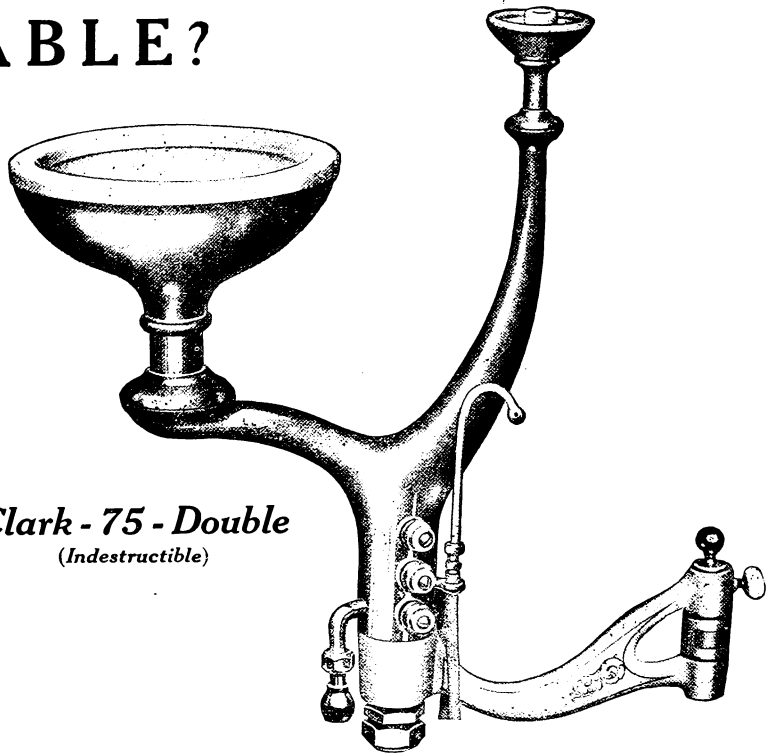
**"The Chayes Grinding Attachment"**

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Of Course You Are,  
When the Water in  
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been **SPLASHING**—  
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Ejector **HISSING** all  
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**Clark - 75 - Double**  
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What a **GREAT RELIEF** that new Clark—75—Double is with  
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and its smooth, quiet running **REVOLVING INNER BOWL**.

**It's as SILENT AS THE SETTING SUN.**

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will gain and hold the good-will of every one of your patients if you prescribe

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### **Soft, Bleeding, Spongy Gum Conditions**

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**THE DENTINOL AND PYORRHOCIDE CO.**

Incorporated

110-112 West 40th Street

New York

# KOLYNOS

After Dr. Leo Rettger, Assistant Professor of Bacteriology and Hygiene of Sheffield Scientific School, Yale University, had shown the long-time Amebicidal Properties of Kolynos in low dilutions, we requested him to determine the short-time disinfectant action of Kolynos—that is, within one minute—upon unencysted and encysted Amebae.

We quote below from his last report under date of October 16th, 1915.

“The destructive action of Kolynos Dental Cream and of Liquid Kolynos is somewhat more pronounced towards the unencysted than the encysted Amebae in the concentration herein recorded.”

“Complete destruction of unencysted Amebae by Kolynos Cream in one minute was brought about in concentrations of 7½ to 12% of the agent.”

“Liquid Kolynos was effective in one minute exposure in the strength of 4%.”

“Encysted Amebae were destroyed in a 12% concentration of Kolynos Cream and in 4% Liquid Kolynos.”

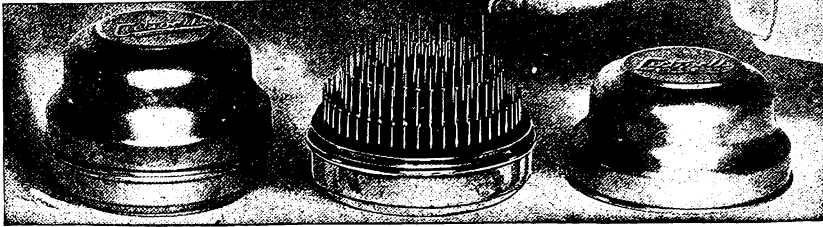
*Samples mailed upon request.*

## THE KOLYNOS COMPANY

NEW HAVEN, CONN.

**\$7.50 per Gross for *Citwell* Burs**

**QUALITY  
UNEQUALLED**



**The Light Touch Does It!**

(PATENT GRANTED DEC. 22, 1914)

**No. 1 Assortment, in Revolving Turret Case, \$7.50**

*Citwell* Burs are made from steel especially prepared for the purpose, the result of exhaustive experiments and tests. It possesses toughness, density, fine grain and machining qualities not found in any other. It is not a carbon steel, but a special alloy that yields very remarkable results both in machining and tempering.

*Citwell* Burs are very straight and true-running. Special *Citwell* Bur steel has much greater strength than any carbon steel; takes much finer temper without sacrificing toughness. Toughness, plus hardness, insures strength and dependability. We start with steel of remarkable quality, handle it correctly, temper it by our own process, and produce the *Citwell* Bur.

*Citwell* Burs are sold on a positive guaranty to do and to be all that we claim for them. If you are not thoroughly satisfied—get your money back.

**STYLES AND PRICES**

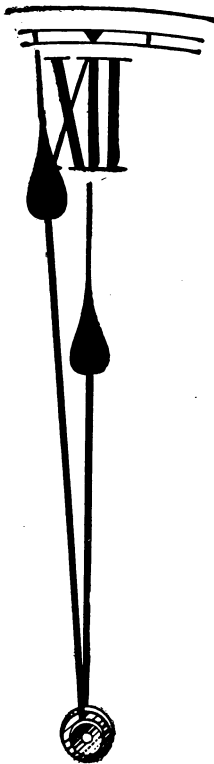
Nos. 1/2 to 7	Per dozen.....\$0.75	Nos. 8 to 11	Per dozen.....\$1.25
Nos. 11 1/2 to 18	Per half gross..... 4.00	Nos. 55 1/2 to 62	Per half gross..... 7.00
Nos. 33 1/2 to 40	Per gross..... 7.50	Nos. 502 to 507	Per gross.....13.00
	In 5-gross lots, gross ... 7.00	Nos. 557 to 562	In 5-gross lots, gross...12.50

**ASSORTMENTS—IN REVOLVING TURRET METAL CASES (patented)**

Assortment No. 1.	(12-dozen Burs at \$0.75 per dozen)	.....\$7.50
Assortment No. 2.	(9 1/2-dozen at \$0.75; 2 1/2-dozen at \$1.25)	..... 8.50

From Your Dealer—if you insist—or Direct from the Proud Maker

*The Ransom & Randolph Co.*  
CLEVELAND TOLEDO GRAND RAPIDS  
COLUMBUS



**AMES'**  
**BERYLITE**  
is the  
**TIME SAVING**  
*ENDURING*  
*ADHESIVE*  
**TRANSLUCENT**  
**CEMENT**

The formula originated in our own laboratory.

We are in position to manufacture  
without embarrassment from  
European complications.

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**THE W. V-B. AMES COMPANY**  
**FREMONT, OHIO**

# QUERY.

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**Why *shouldn't* a copper cement be used for all classes of work if it will not discolor in the mouth? What *possible* harm can it do? Smith's copper cement will not discolor in the mouth under either normal or abnormal conditions.**

**This unqualified claim is not based upon chemical theories alone. The material has been in actual use in the mouth for almost three years.**

*Made in eight shades in the laboratories of*

***Lee S. Smith & Son Co., Pittsburgh, U.S.A.***

*Esthetic  
dentistry requires  
Synthetic Porcelain*

Recently we received a letter, which with the elimination of some irrelevant clauses, reads as follows:

The L. D. Caulk Co.

Gentlemen:-

There are six dentists in this town and I am the youngest. I am the only one using a silicate, -- SYNTHETIC, of course.

They have not yet waked up, which suits me. Many of their patients are coming to me for Synthetic fillings, and I am happy to oblige them.

What I want is all the latest information regarding Synthetic to increase my efficiency.

Some say that my success in this town is remarkable for so young a man. Well, you know the secret, -- SYNTHETIC.

Sincerely,

J--B--F--

*The L. D. Caulk Company  
Laboratories, Milford, Delaware*

# IT STANDS ON ITS RECORD



REPUTATION IS SOMETHING THAT MONEY CANNOT BUY. It must be won. It is not acquired in an instant; time is an important factor. Like a building that is erected brick by brick, it must patiently be built up. Advertising may help, but only when the goods are better than the advertising. During the past ten years

## CAULK'S CROWN & BRIDGE & GOLD INLAY CEMENT

has been the reliance of many thousands of dentists for a wide variety of operations. They have used it to set crowns that have remained, bridges that didn't come loose, facings whose attachment was permanent, inlays that endure. Millions of fillings have been made with it that have stood the test of time.

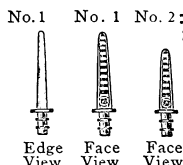
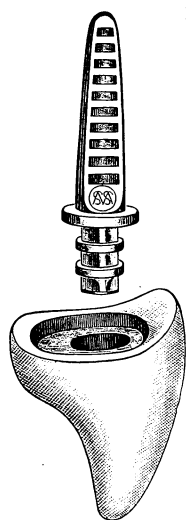
While it has been building a reputation for itself, it has helped to build reputation for 60,000 of its users.

### IT STANDS ON ITS RECORD

Sold by the principal supply houses all over the world, by independent dealers and by those who are endeavoring to sell their own cements in competition.

## The L. D. CAULK COMPANY

*Laboratories:* MILFORD, DELAWARE



# The Profits in the Transaction

With our new Alloy Post you can get the S. S. White Detached-Post Crown complete for 30 cents, a mighty low price when you consider the excellence of the Crown.

The rigidity of the Alloy Post is thoroughly dependable. Of course you can anneal it so that it can be bent in the fitting, but when you have it set, it is amply rigid to withstand the force of mastication. Any solder up to that for 18-K. plate may be used.

The naturalness of the forms, the ample variety, the ease of grinding, the stability and serviceability of the operation it makes, all commend the

**S. S. White Detached-Post Crown**  
aside from its low cost.

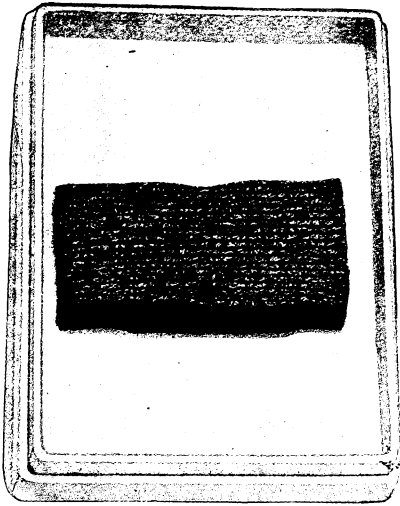
An investment of \$25.00 will get you 100 Detached-Post Crowns, 100 Alloy Posts to set them with, and a convenient tray for holding them, with conveniences for matching in the mouth. The investment will save you \$5.00, make you 20% on the amount involved, and prepare you to suit average cases on sight,—the last probably the most profitable feature of the transaction. It will pay you to look into it.

*For sale by Leading Dental Dealers and at our Houses*

*Illustrated Booklet with Full Details  
Free on Request*

**THE S. S. WHITE DENTAL MANUFACTURING COMPANY**  
**PHILADELPHIA, P. A.**

New York	Boston	Chicago	Brooklyn	Atlanta	Cincinnati
San Francisco		Oakland	Toronto, Can.	Montreal, Can.	



# Makes for Economy of Time and Labor —Eliminates Waste

**T**HERE are the sound-  
est of reasons for the  
fast-growing preference  
of operative dentists for Cor-  
ona Gold. It affords maxi-

imum plasticity and cohesiveness of pure gold because it is pure gold electrolytically laid up in minute fibers.

These fibers are probably the most minute form in which it is practicable to supply or use gold for filling purposes. They are really greatly elongated crystals of the size and shape that nature makes them through the electrolytic process, all intertangled in an inextricable mass. They are so instinct with cohesiveness that the merest touch of the instrument causes them to coalesce, so minute and so close together that you quickly get a dense solid mass.

No wonder you can fill a cavity fast with Corona Gold, even though you use it in small bits. It's economical in other ways; it is always prepared, and there is no waste; if you drop a bit of it the fibers hang together,—don't spatter over the landscape; it has the maximum of softness and cohesiveness without annealing, although it is always advisable to pass all filling golds over the flame on a mica tray to drive off any moisture that may have accumulated.

If you are not familiar with the beauties and excellences of Corona Gold by all means purchase a trial package from your dealer and give it a practical test. You will be satisfied and pleased with the results.

Per 1/10 oz. . . . .	\$3.75
In lots of ½ oz. or over, per oz. . . . .	36.00
Per 1/40 oz . . . . .	1.00

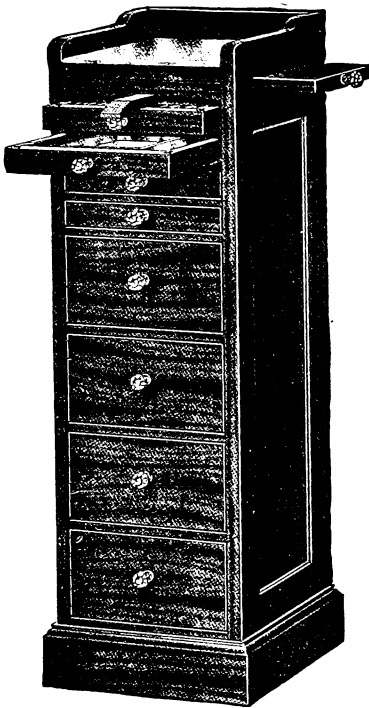
*For Sale by Leading Dental Dealers and at Our Houses*

**THE S. S. WHITE DENTAL MANUFACTURING CO.**  
PHILADELPHIA, PA.

New York	Boston	Chicago	Brooklyn	Atlanta	Cincinnati
San Francisco		Oakland	Toronto, Can.	Montreal, Can.	

# OFFICE BENCH

**T**HERE seems to be considerable demand for a small bench that can be set beside the cabinet in the operating room.



The one shown is 39 $\frac{1}{4}$  inches high overall, 13 $\frac{1}{2}$  inches deep and 13 $\frac{1}{2}$  inches wide overall. It has a white glass working surface and the slide that pulls out to one side gives quite a little additional surface without taking up any room. A filing block can be attached to it and one of the shallow drawers contains a pan for filings. Another is divided by grooved compartments which is for instruments or tools. One of the deep drawers has two metal pans for plaster. The balance are plain drawers.

A little bench of this sort beside your cabinet will save many steps to the laboratory and is a good looking piece of office furniture. It is finished as well as the regular dental cabinet.

## PRICE

Mahogany,  $\frac{1}{4}$  oak, white or gray enamel.....\$25.00

MANUFACTURED BY

## The American Cabinet Company

Two Rivers, Wis.

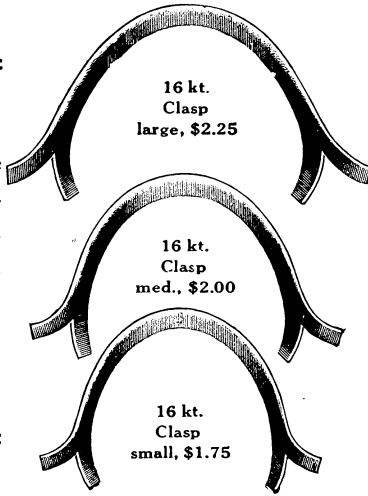
Rahway, N. J.

# JULIUS ADERER'S

## 16 kt. SOLID CLASP GOLD LINGUAL BARS

### READY MADE

Our firm has at no time during its existence, advocated the use of anything likely to place the dentist in an embarrassing position.



These lingual bars are made of 16 kt. SOLID CLASP GOLD 2% PLATINUM, and can, when necessary be soldered without losing the spring temper.

WE DO NOT RECOMMEND GOLD CASED (1/10 18 kt.) lingual bars for PRACTICAL cases to be used in the human mouth, for the reason that the gold casing which covers the base metal filling is altogether too thin, measuring by the micrometer only 2/1000ths of an inch (tissue paper thickness) and which after being worn in the mouth for a very short time, will wear off, exposing the BASE METAL filling, thereby endangering the patient's health.

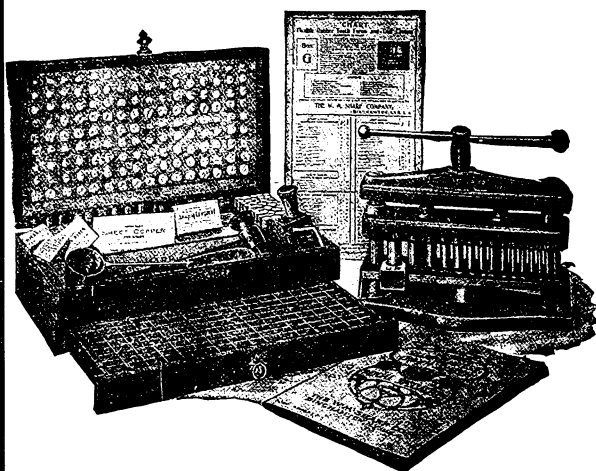
To those wishing the 1/10th gold cased, ready made lingual bars for SAMPLE, OR SHOW CASE PIECES, we can furnish same at 50 cents each, either singly or by the dozen, in any of five sizes.

## JULIUS ADERER, Inc.

### MANUFACTURERS OF DENTAL GOLD AND SOLDER

Main Office: 47 West 42nd Street, New York

# 5 REASONS WHY YOU NEED A Sharp Crown Outfit

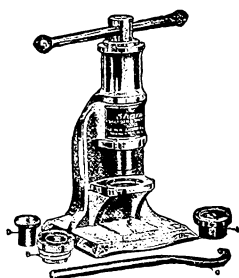


Your crowns will fit;  
Have contact with  
approximate teeth;  
A good articulation;  
A natural contour  
*with*  
A saving in time and  
money.

Get acquainted with our  
Trial Crown Method.

Possible only with the Sharp System

## The Sharp Swaging Press



For backing bridge teeth of any make. Such  
as *Goslee, Steel Posteriors, Evslin,*  
*Dimelow, Todd,* and others.

*Also the ordinary Diatoric.*

BACKING AND BOXING IN AT ONE OPERATION.

Quick and accurate. Takes about one minute to back a tooth  
by our method of equalized pressure. For best results use  
32 Gauge Pure Gold.

THE PRESS IS ALSO USED FOR SWAGING CROWNS BY SCREW PRESSURE

*Write for catalog and price-list*

## THE W. M. SHARP COMPANY

130 Park Ave., Binghamton, N. Y.

ESTABLISHED 1865

# SAMSON RUBBER

**EUGENE  
DOHERTY**

**DENTAL  
RUBBERS**



Trade Mark  
No. 3788

Registered  
June 20, 1876

## RETAIL PRICE-LIST

### SAMSON RUBBER . . .

	Per lb.	5 lb. lots	10 lb. lots	25 lb. lots	50 lb. lots
	\$3.75	\$3.60	\$3.45	\$3.35	\$3.25

Pink Rubber, light shade.....	}	Per lb.	5 lb. lots	10 lb. lots	25 lb. lots
Pink Rubber, medium light shade.....					
Pink Rubber, deep shade.....					
White Rubber.....					
		\$6.00	\$5.50	\$5.00	\$4.60

No. 1 Rubber, medium red.....	}	Per lb.	5 lb. lots	10 lb. lots	20 lb. lots	40 lb. lots
No. 2 Rubber, extra light red.....						
Mottled Rubber, light or dark shade.....						
		\$3.20	\$3.05	\$2.90	\$2.65	\$2.50
		3.50	3.25	2.95	2.85	2.65

Para Black Rubber.....	}	Per lb.	5 lb. lots	10 lb. lots	20 lb. lots	40 lb. lots
Pure Black Rubber.....						
Jet Black Rubber.....						
		\$3.50	\$3.25	\$3.10	\$3.00	\$2.90

Gutta Percha, Pink or White, for Base Plates.....	}	Per lb.	5 lb. lots	10 lb. lots	20 lb. lots	40 lb. lots
		\$3.15	\$3.05	\$2.95	\$2.85	\$2.75

### Eugene Doherty's New Hold Fast Maroon Colored Rubber

Maroon Rubber, light shade.....	}	Per lb.	5 lb. lots	10 lb. lots	25 lb. lots	50 lb. lots
Maroon Rubber.....						
White Gutta Percha, in round sticks for Permanent Filling.....						
		\$3.75	\$3.25	\$3.15	\$3.05	\$2.95

Red Vulcanizable Gutta Percha for plates.....	}	Per lb.	10 lb. lots	25 lb. lots
Black Vulcanizable Gutta Percha for plates.....				
Maroon Vulcanizable Gutta Percha for plates.....				
Pink Vulcanizable Gutta Percha for coating purposes.....				
		\$4.25	\$4.00	\$3.75
		4.50	4.25	4.00
		4.50	4.25	4.00
		6.75	6.50	6.25

Deep Orange Rubber.....	}	Per lb.	5 lb. lots	10 lb. lots	25 lb. lots
20 Minute Rubber for repairing purposes.....					
Black or Red Flexible or Palate Rubber for lining plates.....					
		\$3.25	\$3.05	\$2.85	\$2.65
		3.25			
		3.75			

### NONPAREIL RUBBER

New Idea Rubber.....	}	Per lb.	5 lb. lots	10 lb. lots	20 lb. lots
		\$2.75	\$2.60	\$2.50	\$2.45
		3.25	2.90		

Rubber Dam, medium, 5 and 6 inches wide.....	}	Per yard roll	Per half yard roll
Rubber Dam, thin, 5 and 6 inches wide.....			
		\$1.75	\$0.90
		1.35	.70

No. 1 Weighted Rubber for lower plates.....	}	Per lb.	5 lb. lots	15 lb. lots	20 lb. lots
No. 2 Weighted Rubber for upper or lower plates.....					
Black Weighted Rubber for lower plates.....					
		\$4.25	\$4.05	\$3.85	\$3.55
		4.00	3.80	3.60	3.30

**EUGENE DOHERTY RUBBER WORKS, INC.**

110 & 112 Kent Avenue

BOROUGH OF BROOKLYN, N. Y., U. S. A

# IVORY'S SAW BLADE HOLDER



One of the particular uses of this Instrument is for holding a short piece of a finishing file to polish down the overlapping margins of fillings.

Every angle of the tooth can be reached in the mouth without destroying the contact point as might be the case in using a strip, and without interfering with the cheek or lips.

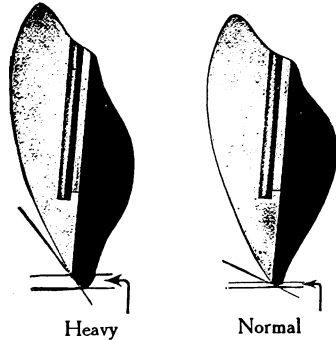
Price, each . . . \$2.50

J. W. IVORY

21 N. 13th Street

PHILADELPHIA, PA.

# The Secret of Protection



*The PROTECTION OF PIN FACINGS is controlled by no particular method, for they can fracture, do fracture, and will fracture at the most inopportune time.*

*All of the old methods of tip protection where the porcelain was bevelled have been denounced—even by the users of Pin Facings, as THE WRONG PRINCIPLE.*

## The Secret

PROTECTION THAT PROTECTS is EXTENSION TIP PROTECTION, a method created, developed and proved through the use of

## Steele's Interchangeable Facings

Heavy, normal or light protection to the porcelains, as the case demands is absolutely *under your control*.

Address us for the latest booklet *Steele's* illustrating and describing the technique of Extension Tip Protection.

The Columbus Dental Manufacturing Company  
Columbus, Ohio

For Information and Prices in Europe and her Colonies, address our Agents  
DE TREY & CO., Limited  
12-13-14 Denman Street, Piccadilly Circus  
London, W.

## **The Post Graduate School of Orthodontia of the Forsyth Dental Infirmary for Children**

*offers an advanced course of thirty-two weeks  
from October to May eclectic in character*

Unexcelled Clinical opportunities.

Broad and thorough theoretical instruction.

A full staff of lectures.

Correspondence solicited.

**No. 140 The Fenway, Boston**

## **The Carr School of Preventive Dentistry and Medicine**

INCORPORATED

CHICAGO, ILLINOIS

### **PRACTITIONERS' COURSE**

The paramount object of the Practitioners' Course of this Institution is the cure of Pyorrhea. This the Institution contracts to teach to all graduates to their own entire satisfaction, or no pay. Four hundred practitioners who have graduated from the Institution under this contract attest the worth of this teaching.

The Practitioners' Course is open from September 1st to December 10th, and from January 10th to May 10th.

**30 NORTH DEARBORN ST., CHICAGO, ILL.**

**C. M. CARR, President**

*Names and addresses of graduates cheerfully furnished*

# New York College of Dentistry

1916-1917

51st COLLEGIATE YEAR

## Infirmary Course

June 16th to September 23rd, 1916 (Optional and Free)

## Lecture Session

September 25th, 1916, to June 16th, 1917 (Obligatory)

For admission, preliminary educational curriculum and other requirements write for an announcement

ADDRESS ALL COMMUNICATIONS TO

**NEW YORK COLLEGE OF DENTISTRY**

**COLLEGE ANNEX:**  
155-159 East 23rd Street

205-207 East 23rd Street  
New York, N. Y.

# UNIVERSITY of CALIFORNIA

## College of Dentistry

**SAN FRANCISCO  
CALIFORNIA**

The next regular session will begin on August 16, 1915. For information regarding matriculation address the Recorder of Faculties at Berkeley, California. For information regarding dental curriculum and admission to advance standing address the Dean, 1st and Parnassus Aves, San Francisco.

# INDIANA DENTAL COLLEGE

An institution that has been teaching the science and art of dentistry successfully for over thirty years,

**OFFERS A THREE-YEAR COURSE**

Unexcelled by any dental teaching institution in the world

**LEADING TO THE DEGREE OF D. D. S.**

For catalogue and booklet, address the College at

**INDIANAPOLIS      :      :      :      INDIANA**

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### COLLEGE OF MEDICINE SCHOOL OF DENTISTRY

The next session begins October 1st, 1915.

NEW ORLEANS, the metropolis of the South, offers unlimited clinical material, complete educational facilities, and delightful winter climate, etc. The Faculty has been re-organized, and the curriculum revised to conform with modern methods. The Infirmary has been entirely remodelled, renovated, and equipped with the latest facilities for teaching advanced methods in every department.

**Dentistry is taught by Lectures, Demonstrations and Infirmary Practice**

*For further information and announcement, address*

**Women Admitted**

**WALLACE WOOD, Jr., D.D.S., Dean**  
Hutchinson Memorial, 1551 Canal St.

**New Orleans, La.**

## THE TEMPLE UNIVERSITY

### Philadelphia Dental College

Eighteenth and Buttonwood Streets, Philadelphia

**RUSSELL H. CONWELL, D.D., LL.D., President**

**SIMEON H. GUILFORD, A.M., D.D.S., Ph.D., Dean**

== Fifty-third Annual Session 1915-1916 ==

Located in a section of Philadelphia not far from its center and in close proximity to the United States Mint, Carnegie Library and Fairmount Park, with buildings specially designed and equipped for its purposes this institution offers many advantages to those desiring to prepare themselves for the practice of Dentistry.

Instruction is provided through didactic lectures, laboratory work, technic training and infirmary practice under skilled supervision.

Course for the degree of D.D.S. covers three years, each term beginning October 1st, and ending June 1st of the following year.

#### PRACTITIONERS' COURSE

To meet the demands of practitioners who desire to familiarize themselves with the most recent advances along practical lines, the College has inaugurated special courses in Operative and Prosthetic Dentistry, Crown and Bridge Work, Gold Casting, Dental Ceramics, and Anesthesia.

Courses open during the regular winter term or in late spring and early summer. Only practitioners will be received. Outline of courses and scale of fees forwarded on request to the Dean.

Announcements and full information can be obtained by addressing

**DR. S. H. GUILFORD, Dean**

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### FORMERLY BOSTON DENTAL COLLEGE

416 HUNTINGTON AVENUE, BOSTON

**Offers a complete course in all branches of practical and scientific Dentistry.**

The opening exercises of the school are held the last Wednesday in September of each year.

A catalog will be mailed upon application to the Secretary.

# The Medico-Chirurgical College of Philadelphia

## DEPARTMENT OF DENTISTRY

Advantageously located in the city that has a world-wide reputation in this Science. The buildings are centrally located and are modern and complete in every respect.

The Department of Dentistry is an integral part of the Medico-Chirurgical College, and the students enjoy all the privileges accorded to students of the Departments of Medicine, Pharmacy and Pharmaceutical Chemistry. Students of the Department of Dentistry are on an absolute equality with the students of the other departments. Every branch of medical teaching in the College is open to dental students for perfecting themselves in any special direction.

It is believed that the demands for a broader culture and higher attainments in the field of dentistry can best be met by the co-education of medical and dental students in dental departments of medical schools in so far as the curricula of these schools coalesce.

It is unquestionably true that, given equal manipulative skill, the dentist who possesses the widest knowledge of the medical sciences underlying the practice of dentistry will be the most competent practitioner. Proceeding on these principles, the Department of Dentistry of the Medico-Chirurgical College aims to train the technical ability of its students, at the same time imparting a thorough knowledge of the medical branches included in the curriculum.

In addition to the facilities offered by the Department of Dentistry, the clinics of the Medico-Chirurgical College offer to the dental students a large field for the practical study of general and oral surgery. The department of oral surgery is thoroughly organized, and the number and variety of cases attending the dispensary enable the faculty to give a thorough and practical course in diseases of the mouth.

The most modern equipment is in use in the operating rooms and laboratories. The clinical facilities are unexcelled. The thorough course given in diseases of the mouth and teeth is made practical by the number of dispensary cases, amounting to several thousand each session.

A valuable feature is the complete system of quizzing by the professors, free of charge.

*Write for illustrated catalogue describing courses in full  
and containing all information as to fees, etc. Address*

**I. N. BROOMELL, D. D. S., Dean, 17th and Cherry Sts., Philadelphia, Pa.**

## The POSTGRADUATE SCHOOL of DENTISTRY of PHILADELPHIA

(Chestnut and Nineteenth Streets)

permanently located in the center of Philadelphia, and not under the control of any other dental institution, with every modern facility for the Dental Practitioner and the new Graduate in Dentistry to perfect himself in practical

### REMOVABLE and STATIONARY CROWN and BRIDGEWORK

covering every phase of this important branch of dentistry, including practical work in the mouths of patients, and the all-important Preparation of Abutments, under the personal instruction of **Albert W. Jarman, D.D.S.**

An unsurpassed and complete dental equipment in the clinic, including latest electric engines, fountain cuspidors, sterilizers and dental chairs, provides every advantage for conducting postgraduate work. Clinical patronage in excess of needs.

The laboratories are thoroughly equipped with individual electric motors for grinding, and individual electric lathes of latest pattern. This work is conducted under the personal supervision of **Arthur N. Cross.**

**LOCAL ANESTHESIA** with special consideration of **NOVOCAIN-SUPRARENIN** and the various forms of intra-alveolar, periodental, mucous and conductive injections. **Richard Riethmueller, Ph.D., D.D.S.**

**ANESTHESIA and ANALGESIA, GAS and OXYGEN**, full instruction in how to administer. **Dr. Theo. D. Casto.**

**PORCELAIN WORK** including everything that is known to be practical in the use of Porcelain.

Practical course in **ORAL PROPHYLAXIS**, including the treatment of so-called Pyorrhea. Special clinic for this work.

These courses can be taken separately or conjunctively. Send for circular.

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**Chestnut and 19th Sts., Philadelphia, Pa.**

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302-304-306 East 35th Street

**Large New Building with New Equipment**

**Co-Educational**

*Member of the National Association of Dental Faculties*

**JWM. CARR, M.D., D.D.S., Dean**

**302 East 35th Street, N. Y.**

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**The College gives a three years' course of thorough instruction in all  
branches of modern dentistry**

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Dean of the Faculty, Professor of Oral Surgery.

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Registrar, Professor of Anatomy and Histology.

**Worthington Seaton Russell, M.D.,**

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Therapeutics and of Pathology.

**Delancey Walton Ward, Ph.D.,**

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**Arthur Lessner Swift, D.D.S.,**

Professor of Operative Dentistry and of Dental Pathology and  
Therapeutics.

**Herbert Locke Wheeler, D.D.S.,**

Professor of Prosthetic Dentistry.

**Henry H. Janeway, A.B., M.D.,**

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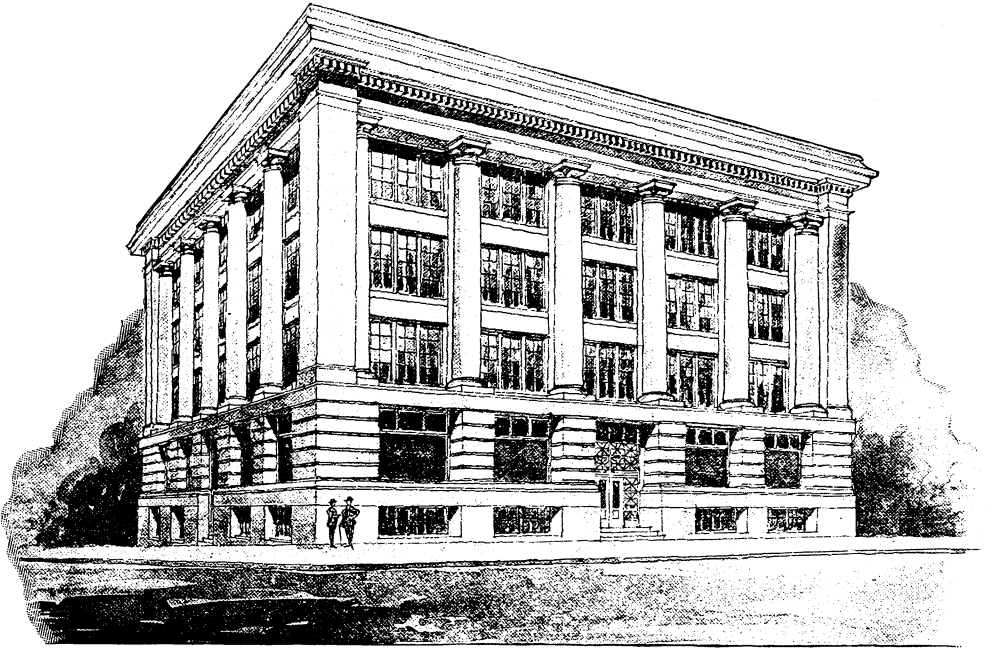
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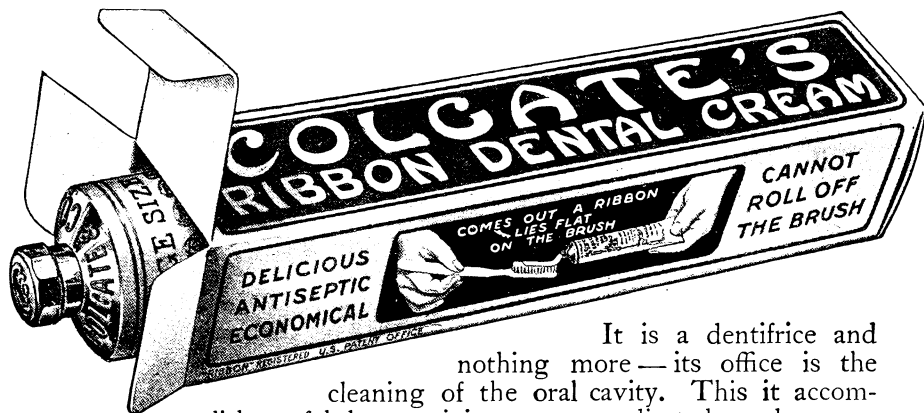
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*Because they're "cheap."* (Are they? How can you tell? Have you had them analyzed? Do you know how much or how little gold they contain?)

*Because I haven't time to investigate.* (Did you say so when you bought your outfit for the reception room, operating room, and laboratory? Did you order the first chair, bracket table, switchboard and attachments, benches, sinks, lathes, soldering appliances, articulators or trays, that way? Did you not "investigate" before buying?)

*Because they do not cut much figure anyway.* (Do you think so? Do you realize that for them you pay more than  $\frac{1}{3}$  of your outlays for materials?)

*Because they're "about as good" as any.* (Really? That is a novel idea. Is a 29-jewel Nardin chronometer only "about as good" as a dollar stem-winder? Isn't it better? Isn't it best of all makes?)

*Because it isn't my business if men make bad stuff.* (That's true. It's no more your concern than it is when men make bad whiskey, that ruins happy homes and turns people into demons; or if men make bichloride of mercury, which is taken with suicidal intent. But is it or isn't it your business, if you use, distribute and help to perpetuate the manufacture of those poisons?)

*Because my future doesn't worry me.* (We congratulate you! Ours worries us lots, for fear that more bad golds will be sold, because many dentists suffer from chronic apathy.)

*Because my professional reputation is good enough.* (That's fine but will it last? How can it, being founded on the quicksands of ununiform, non-durable and impure golds? Will any Surety Company guarantee it even for three years? What premium will they demand for "going on the risk"?)

*Because fillings will come out, and joints will part anyway.* (Stop! That's going too far. If true, why not do your gold work as quick as lightning? Why waste time on it? The Pyramids have endured for centuries. They haven't "come out". Their "joints" will not "part". It's only at Panama that slides close a canal for weeks.)

*Because I do not trouble myself about my patients' welfare.* (Then it's high time for you to begin. You would not offer them an affront or do them an injury. You like to be known as "a gentle operator". Have you stopped to think that it's worse than effrontery or harsh treatment for you to use in their mouths bad golds?)

*Because I do not care how patients will talk!* (Yes, you do. Upon whether they commend or decry you, your financial solvency or bankruptcy will depend. Grasp that fact. You can not get away from it. Men "seek the bubble reputation at the cannon's mouth", but when won—if it's favorable—they preserve it at all cost.)

*Because I do not care a snap about my moral obligation!* (Farewell! Your case is almost hopeless. There's only one thing for you to do, before it is forever too late. GO or SEND NOW to your dealer for an ample supply of the World's Best Dental Golds and Solders—NEYS! They'll cure the disease.)



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